# HANDBOOK OF PSYCHOPATHY SECONDEDITION



## edited by CHRISTOPHER J. PATRICK

### HANDBOOK OF PSYCHOPATHY

# HANDBOOK OF PSYCHOPATHY

### SECOND EDITION

edited by CHRISTOPHER J. PATRICK



THE GUILFORD PRESS New York London Copyright © 2018 The Guilford Press A Division of Guilford Publications, Inc. 370 Seventh Avenue, Suite 1200, New York, NY 10001 www.guilford.com

All rights reserved

No part of this book may be reproduced, translated, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, microfilming, recording, or otherwise, without written permission from the publisher.

Printed in the United States of America

This book is printed on acid-free paper.

Last digit is print number: 9 8 7 6 5 4 3 2 1

The authors have checked with sources believed to be reliable in their efforts to provide information that is complete and generally in accord with the standards of practice that are accepted at the time of publication. However, in view of the possibility of human error or changes in behavioral, mental health, or medical sciences, neither the authors, nor the editors and publisher, nor any other party who has been involved in the preparation or publication of this work warrants that the information contained herein is in every respect accurate or complete, and they are not responsible for any errors or omissions or the results obtained from the use of such information. Readers are encouraged to confirm the information contained in this book with other sources.

#### Library of Congress Cataloging-in-Publication Data

Names: Patrick, Christopher J., editor.
Title: Handbook of psychopathy / edited by Christopher J. Patrick.
Description: Second edition. | New York : The Guilford Press, 2018. | Includes bibliographical references and index.
Identifiers: LCCN 2017035986 | ISBN 9781462535132 (hardcover)
Subjects: LCSH: Antisocial personality disorders—Handbooks, manuals, etc.
Classification: LCC RC555 .H357 2018 | DDC 616.85/82—dc23
LC record available at https://lccn.loc.gov/2017035986 To my wife, Deb, and my daughters, Sarah and Lili

### About the Editor

Christopher J. Patrick, PhD, is Professor of Psychology at Florida State University. His research interests include psychopathy, antisocial behavior, substance abuse, personality, fear and fearlessness, psychophysiology, and affective and cognitive neuroscience, and he is the author of more than 270 articles and chapters on these topics. Dr. Patrick is past president of the Society for the Scientific Study of Psychopathy (SSSP) and the Society for Psychophysiological Research (SPR), a recipient of Early Career awards from SPR and the American Psychological Association (APA), and a recipient of SSSP's Lifetime Career Contribution award. He is also a Fellow of APA and of the Association for Psychological Science. Dr. Patrick served as a workgroup member for the Research Diagnostic Criteria initiative of the National Institute of Mental Health and as a scientific advisor to the DSM-5 Personality Disorders Workgroup. He is currently a member of the American Psychiatric Association's Review Committee for Externalizing Disorders and Personality Disorders, which evaluates proposed changes to DSM-5.

### Contributors

Henrik Andershed, PhD, School of Law, Psychology, and Social Work, Örebro University, Örebro, Sweden

Stephen D. Benning, PhD, Department of Psychology, University of Nevada, Las Vegas, Las Vegas, Nevada

Henriette Bergstrøm, PhD, Department of Social Sciences, University of Derby, Derby, United Kingdom

**Pamela J. Black, MA,** Department of Psychology, University of British Columbia Okanagan, Kelowna, British Columbia, Canada

**R. James R. Blair, PhD,** Center for Neurobehavioral Research, Boys Town National Research Hospital, Boys Town, Nebraska

Abby P. Clark, MA, Department of Psychology, University of Alabama, Tuscaloosa, Alabama

David J. Cooke, PhD, Department of Psychosocial Science, University of Bergen, Bergen, Norway

Cristina Crego, MS, Department of Psychology, University of Kentucky, Lexington, Kentucky

Karen J. Derefinko, PhD, Department of Preventive Medicine, University of Tennessee Health Science Center, Memphis, Tennessee Kevin S. Douglas, PhD, Department of Psychology, Simon Fraser University, Burnaby, British Columbia, Canada

Laura E. Drislane, PhD, Department of Psychiatry, University of Michigan, Ann Arbor, Michigan

John F. Edens, PhD, Department of Psychology, Texas A&M University, College Station, Texas

Jarrod M. Ellingson, PhD, Department of Psychology and Neuroscience, University of Colorado Boulder, Boulder, Colorado; Department of Psychological Sciences, University of Missouri, Columbia, Missouri

Kostas A. Fanti, PhD, Department of Psychology, University of Cyprus, Nicosia, Cyprus

David P. Farrington, PhD, Institute of Criminology, Cambridge University, Cambridge, United Kingdom

Jens Foell, PhD, Department of Psychology, Florida State University, Tallahassee, Florida

Katherine A. Fowler, PhD, Department of Psychology, Emory University, Atlanta, Georgia

**Don C. Fowles, PhD,** Department of Psychology, University of Iowa, Iowa City, Iowa

**Paul J. Frick, PhD,** Department of Psychology, Louisiana State University, Baton Rouge, Louisiana

#### Contributors

Jean-Pierre Guay, PhD, School of Criminology, University of Montreal, Montreal, Quebec, Canada

Jason R. Hall, PhD, Department of Psychology, Emory University, Atlanta, Georgia

Rachel Bencic Hamilton, MS, Department of Psychology, University of Wisconsin–Madison, Madison, Wisconsin

Robert D. Hare, PhD, Darkstone Research Group and Department of Psychology, University of British Columbia, Vancouver, British Columbia, Canada

**Eric W. Hickey, PhD,** Forensic Psychology PhD Program, Walden University, Minneapolis, Minnesota

Brian M. Hicks, PhD, Addiction Research Center, University of Michigan, Ann Arbor, Michigan

**Soonjo Hwang, MD,** Department of Psychiatry, University of Nebraska Medical Center, Omaha, Nebraska

William G. Iacono, PhD, Department of Psychology, University of Minnesota, Minneapolis, Minnesota

Shannon E. Kelley, MS, Department of Psychology, Texas A&M University, College Station, Texas

**Eva R. Kimonis, PhD,** School of Psychology, University of New South Wales, Sydney, Australia

**Raymond A. Knight, PhD,** Department of Psychology, Brandeis University, Waltham, Massachusetts

David S. Kosson, PhD, Department of Psychology, Rosalind Franklin University of Medicine and Science, Chicago, Illinois

**Robert D. Latzman, PhD,** Department of Psychology, Georgia State University, Atlanta, Georgia

Scott O. Lilienfeld, PhD, Department of Psychology, Emory University, Atlanta, Georgia; School of Psychological Sciences, University of Melbourne, Melbourne, Australia

Andrew K. Littlefield, PhD, Department of Psychology, Texas Tech University, Lubbock, Texas

**Caroline Logan, DPhil,** Specialist Services Network, Greater Manchester Mental Health NHS Foundation Trust, and University of Manchester, Manchester, United Kingdom **Devon LoParo, MA,** Department of Psychiatry and Behavioral Sciences, Emory University, Atlanta, Georgia

Alexandros Lordos, PhD, Centre for Sustainable Peace and Democratic Development, Nicosia, Cyprus

**David T. Lykken, PhD** (deceased), Department of Psychology, University of Minnesota, Minneapolis, Minnesota

**Donald R. Lynam, PhD,** Department of Psychological Sciences, Purdue University, West Lafayette, Indiana

Monica A. Marsee, PhD, Department of Psychology, Iowa State University, Ames, Iowa

Abigail A. Marsh, PhD, Department of Psychology, Georgetown University, Washington, DC

**Kristen L. McCrary, PsyD,** School of Professional Psychology, Spalding University, Louisville, Kentucky

Harma Meffert, PhD, Social Cognition Research Program, Center for Neurobehavioral Research, Boys Town National Research Hospital, Boys Town, Nebraska

Joshua D. Miller, PhD, Department of Psychology, University of Georgia, Athens, Georgia

Andreas Mokros, DrPhil, Department of Psychology, University of Hagen, Hagen, Germany

Lindsay D. Nelson, PhD, Translational and Biomedical Research Center, Medical College of Wisconsin, Milwaukee, Wisconsin

**Craig S. Neumann, PhD,** Department of Psychology, University of North Texas, Denton, Texas

Joseph P. Newman, PhD, Department of Psychology, University of Wisconsin–Madison, Madison, Wisconsin

Isabella M. Palumbo, BS, Department of Psychology, Georgia State University, Atlanta, Georgia

**Dustin A. Pardini, PhD,** School of Criminology and Criminal Justice, Arizona State University, Tempe, Arizona

Yunsoo Park, PhD, Department of Psychology, Emory University, Atlanta, Georgia

#### Contributors

Christopher J. Patrick, PhD, Department of Psychology, Florida State University, Tallahassee, Florida

John Petrila, JD, Meadows Mental Health Policy Institute, Dallas, Texas

Devon L. L. Polaschek, PhD, School of Psychology, University of Waikato, Hamilton, New Zealand

Stephen Porter, PhD, Department of Psychology, University of British Columbia Okanagan, Kelowna, British Columbia, Canada

Adrian Raine, PhD, Department of Criminology, University of Pennsylvania, Philadelphia, Pennsylvania

Soo Hyun Rhee, PhD, Department of Psychology and Neuroscience, University of Colorado Boulder, Boulder, Colorado

Randall T. Salekin, PhD, Disruptive Behavior Clinic, Department of Psychology, University of Alabama, Tuscaloosa, Alabama

Martin Sellbom, PhD, Department of Psychology, University of Otago, Dunedin, New Zealand

Kenneth J. Sher, PhD, Department of Psychological Sciences, University of Missouri, Columbia, Missouri

**Jennifer L. Skeem, PhD,** School of Social Welfare, University of California, Berkeley, Berkeley, California

Sarah Francis Smith, PhD, Department of Psychology, Emory University, Atlanta, Georgia

**Elizabeth A. Sullivan, PhD,** New Mexico VA Health Care System, Albuquerque, New Mexico

Noah C. Venables, PhD, Departments of Psychiatry and Psychology, University of Minnesota, Minneapolis, Minnesota

Alvaro Vergés, PhD, School of Psychology, Pontifical Catholic University of Chile, Santiago, Chile Edelyn Verona, PhD, Department of Psychology, University of South Florida, Tampa, Florida

**Essi Viding, PhD,** Division of Psychology and Language Sciences, University College London, London, United Kingdom

Gina M. Vincent, PhD, Center for Mental Health Services Research, Department of Psychiatry, University of Massachusetts Medical School, Worcester, Massachusetts

Jennifer Vitale, PhD, Department of Psychology, Hampden-Sydney College, Hampden-Sydney, Virginia

Irwin D. Waldman, PhD, Department of Psychology, Emory University, Atlanta, Georgia

Bethany K. Walters, BA, California School of Forensic Studies, Alliant International University, Fresno, California

Ashley L. Watts, MA, Department of Psychology, Emory University, Atlanta, Georgia

Stuart F. White, PhD, Decision-Making Research Program, Center for Neurobehavioral Research, Boys Town National Research Hospital, Boys Town, Nebraska

Thomas A. Widiger, PhD, Department of Psychology, University of Kentucky, Lexington, Kentucky

Michael T. Woodworth, PhD, Department of Psychology, University of British Columbia Okanagan, Kelowna, British Columbia, Canada

**Dustin B. Wygant, PhD,** Department of Psychology, Eastern Kentucky University, Richmond, Kentucky

Yaling Yang, PhD, Division of Research on Children, Youth and Families, Department of Pediatrics, Children's Hospital Los Angeles, Los Angeles, California

#### х

### Preface

he aim of the first edition of this handbook, published in 2006, was to provide a comprehensive survey of available scientific knowledge at that time on the topic of psychopathy (psychopathic personality). My closing chapter for that edition, titled "Back to the Future: Cleckley as a Guide to the Next Generation of Psychopathy Research," used Hervey Cleckley's (1941/1976) classic clinical description of psychopathy as a touchstone for appraising the state of published work in this area and identifying key unresolved questions in need of further study. This new edition is a much different book, with a different purpose. Its emphasis is on new developments since 2006 and on specific avenues for continuing research that can move us toward a deeper and more practically useful understanding of this critically important phenomenon. As such, it complements rather than supersedes the first edition.

There have been a number of major developments in the psychopathy area since publication of the first edition. One has been a renewal of appreciation for the distinction between theoretical constructs and manifest operationalizations (i.e., models vs. measures) in the study of psychopathy (see, e.g., Hare & Neumann, 2008, 2010; Skeem & Cooke, 2010a, 2010b; Skeem, Polaschek, Patrick, & Lilienfeld, 2011). This has led to increased openness to, and recognition of the need for, alternative approaches to assessing psychopathy for particular purposes (e.g., for studying younger vs. older participants, or individuals from the general community, as opposed to criminal offenders; for investigation of distinct variants of psychopathy, such as "successful" types). Another key development, evident in the study of psychopathology more broadly (e.g., Kotov et al., 2017), has been a move toward viewing psychopathy as a continuous or dimensional condition rather than a discrete or "taxonic" disorder-and toward use of terms such as "high-psychopathic offenders" or "individuals high in psychopathic traits" in place of "psychopaths." This development is important because it has led researchers to study psychopathic symptomatology, at varying levels of intensity or severity, in general clinical and community samples as well as in correctional and forensic inpatient settings.

A further development in the field has been toward studying psychopathy in terms of symptom subdimensions (or facets), rather than total psychopathy scores. This shift in focus reflects growing evidence that different symptom facets of psychopathy show contrasting relations with criterion measures of various types—ranging from reported anxiousness to cognitive-task performance to affective–physiological reactivity—and that distinguishable variants ("subtypes") of psychopathy exist, reflecting different configurations of underlying traits (see Hicks & Drislane, Chapter 13, this volume). Related to the increased emphasis on symptom subdimensions, there has been growing recognition of the etiological complexity of psychopathy, at the level of both genetic and environmental influences contributing to it and neuropsychological systems and processes associated with it. This mounting appreciation for the phenotypic diversity and etiological complexity of psychopathy mirrors broader trends in psychopathology research. As a notable example, the National Institute of Mental Health (NIMH) established its Research Domain Criteria (RDoC; Insel et al., 2010; Kozak & Cuthbert, 2016) framework to encourage an investigative focus on clinical symptom dimensions and the interplay of distinct biobehavioral processes assessed in multiple complementary ways (e.g., genomically, neurally, behaviorally, experientially) in studies of psychopathology.

This edition of the Handbook of Psychopathy showcases these and other recent developments (e.g., representation of adult and child psychopathy in the latest, fifth edition of the Diagnostic and Statistical Manual of Mental Disorders [DSM-5; American Psychiatric Association, 2013]) and advances in treatment of psychopathy) and offers a conceptual roadmap for further investigative efforts. Most contributors to the first edition, all of them leading investigators in the field, are included again as authors, but the current volume includes a number of additional experts, and several of the chapters are completely new. All others have been extensively rewritten to reflect recent findings and perspectives, apart from the chapter by Lykken, who passed away shortly after the first edition was published. His contribution to the first edition-retitled "Psychopathy, Sociopathy, and Antisocial Personality Disorder"-is reprinted in full here, but accompanied by a new scholarly commentary by Iacono, Dr. Lykken's close colleague and former doctoral advisee.

Another feature of this new edition is its use of a recent influential model, the triarchic conceptualization of psychopathy (Patrick, Fowles, & Krueger, 2009; see also Patrick & Drislane, 2015), as a point of reference for integrating findings from diverse lines of research employing differing assessment methods. This model, described in my opening chapter for this volume and cited in various others that follow, characterizes psychopathy in terms of three distinct biobehavioral dispositions (i.e., traits with clear referents in biology and behavior): "boldness," or fearless dominance (see Lilienfeld, Watts, Smith, & Latzman, Chapter 8, and Sellbom, Lilienfeld, Fowler, & McCrary, Chapter 10); "meanness," or callousness–unemotionality

(see Frick & Marsee, Chapter 19; Viding & Kimonis, Chapter 7); and "disinhibition," or externalizing proneness (see Nelson & Foell, Chapter 6). The model holds that these dispositions are represented to varying degrees in all historic and contemporary accounts of psychopathy and assorted instruments that have been developed to assess it. As dispositional dimensions, the constructs of the triarchic model relate to normal-range personality traits that connect descriptively to psychopathy (see, e.g., Lynam, Miller, & Derefinko, Chapter 11). However, as biobehavioral dispositions, they are uniquely advantageous for linking symptomatic features of psychopathy to neurobiological systems and processes (see Patrick, Chapter 18). My hope is that use of the triarchic model as a conceptual referent throughout this volume will help to address the comment made by one reviewer of the first edition that the book could benefit from "an executive intelligence to help guide us toward what this all means" (Sadler, 2006, p. 2).

As with the original version of this handbook, the emphasis in this edition is on breadth of coverage and balanced consideration of alternative theoretical views. Authors were asked to provide broad reviews of published work in designated topic areas, with priority assigned to coverage of existing empirical findings, particularly newer work (i.e., since 2006); theories are discussed as they relate to lines of work that derive from them, and differing interpretive frameworks are considered. For each chapter, a description of the desired content coverage was provided to the author(s) and, based on a review of the initial draft submission, suggestions were made for additional published work to include. These steps helped to ensure effective and complementary coverage of the major topics of interest in this field of study while limiting redundancy of presentation across chapters.

In line with the first edition, chapters are organized into broad thematic sections. Part I covers foundational theories and findings. It begins with a chapter I contributed, focusing on Cleckley's (1941/1976) description of psychopathy as a "masked" pathology in which a severely impaired capacity for behavioral control is concealed by an outward appearance of psychological normality ("sanity"). Cleckley's ideas about psychopathy are discussed in relation to major developments in the field (as mentioned earlier) and in terms of their implications for unresolved questions and ongoing debates. Chapter 2, by Lykken, compares and contrasts concepts of "psychopathy," "sociopathy," and "antisocial personality disorder" and discusses causal factors relevant to each, followed by Iacono's accompanying commentary. The next chapter, by Hare, Neumann, and Mokros, focuses on the Psychopathy Checklist-Revised (PCL-R; Hare, 2003), the best established measure of psychopathy for use with adult offenders and associated versions developed for (1) adolescent offenders, (2) interview-based screening, and (3) self-report screening. The PCL-R is considered foundational to the study of psychopathy because of its links to Cleckley's classic conceptualization, its focus on criminal psychopathy and its usefulness with offender samples, and the very large body of published work that exists on its measurement properties and clinical-psychological correlates. The other two chapters in Part I provide coverage of foundational perspectives regarding mechanisms of psychopathic symptomatology. In Chapter 4, Hamilton and Newman summarize existing evidence for the response modulation hypothesis, which posits a core cognitive deficit in psychopathy involving a weakness in the capacity to process contextual cues and redirect attention when engaged in active goal seeking. Fowles, in Chapter 5, reviews evidence for the critical role of temperament-defined as early-emerging, biologically based variations in affective-behavioral style-in psychopathy. Referencing evidence (as noted earlier) for contrasting correlates of psychopathy subdimensions and distinguishable subtypes of high-psychopathy individuals, he proposes that deviations in emotional sensitivity and cognitive processing capacity contribute in unique (and potentially intersecting) ways to the observable symptoms of psychopathy.

Part II, the thematic section of the book titled "Distinct Phenotypic Facets of Psychopathy," is new. It is included in recognition of the shift that has occurred from studying psychopathy as a discrete, unitary condition ("syndrome") to investigating it in terms of symptom subdimensions that relate in contrasting ways with criterion variables of various types. In clinical diagnostic terms, these subdimensions (facets) correspond to interpersonal, affective, and impulsive-behavioral components of psychopathy as measured by the PCL-R and other inventories patterned after it (e.g., Self-Report Psychopathy Scale [SRP; Paulhus, Neumann, Hare, Williams, & Hemphill, 2016]; Youth Psychopathic Traits Inventory [YPI; Andershed, Kerr, Stattin, & Levander, 2002]). From a triarchic model perspective (Patrick et al., 2009), these symptom facets represent phenotypic expressions of core biobehavioral traits-with boldness contributing most distinctively to the interpersonal facet, meanness contributing most to the affective facet, and disinhibition contributing most to the impulsive-behavioral facet (e.g., Drislane, Patrick, & Arsal, 2014; Venables, Hall, & Patrick, 2014). The chapters in Part II review what we currently know about these symptom facets-in terms of their psychological, behavioral, neurophysiological, and clinical correlates—and the dispositional constructs they reflect. In Chapter 6, Nelson and Foell provide coverage of the impulsive-externalizing (disinhibitory) facet; Viding and Kimonis, in Chapter 7, survey the existing literature on the callousness-unemotional (meanness) facet; and in Chapter 8, Lilienfeld and his colleagues provide coverage of the interpersonal-fearless dominance (boldness) facet.

Part III provides coverage of crucial topics in the areas of assessment and diagnosis, again with an emphasis on recent developments and empirical findings. In Chapter 9, which is new to the current edition, Cooke and Logan provide an indepth analysis of conceptual and procedural issues in assessing psychopathy through clinical interview and describe a novel interview-based protocol for this purpose, the Comprehensive Assessment of Psychopathic Personality (CAPP; Cooke, Hart, Logan, & Michie, 2012). In Chapter 10, Sellbom and his coauthors provide updated and expanded coverage of self-report measures for assessing psychopathy, with particular emphasis on the large body of work over the past several years on the Psychopathic Personality Inventory-Revised (PPI-R; Lilienfeld & Widows, 2005; see also Lilienfeld & Andrews, 1996) and discussion of newer inventories including the Triarchic Psychopathy Measure (TriPM; Drislane et al., 2014) and the Elemental Psychopathy Assessment (EPA; Lynam et al., 2011). Lynam, Miller, and Derefinko, in Chapter 11, discuss the benefits of characterizing psychopathy and its facets in terms of traits from the well-known five-factor model (FFM), given its prominence as a descriptive framework in the personality and general psychopathology literatures. They present data showing how FFM traits can be related to psychopathy subdimensions, assessed using the SRP and the YPI, and to the biobehavioral constructs of the triarchic model, assessed using the TriPM. In Chapter 12, Widiger and Crego discuss how psychopathy and its facets, as assessed by the PCL-R and other measures, relate to various psychological disorders as defined in the DSM. Coverage is provided of the new trait-dimensional system for personality disorders in DSM-5, with particular attention to how adult psychopathy is represented in this new traitdimensional system. Part III closes with Chapter 13 on variants (subtypes) of psychopathy, by Hicks and Drislane, who discuss key conceptual and methodological issues in the context of reviewing the growing body of published empirical work on this topic.

Part IV focuses on etiological factors contributing to psychopathy and the role of neurobiological systems and processes in its observable features. Updated and greatly revised coverage is provided of genetic versus environmental influences in Chapter 14, by Waldman and colleagues, and specific family factors in Chapter 15, by Farrington and Bergstrøm. Chapters on neuroanatomical correlates of psychopathy and deviations in brain function as revealed by neuroimaging research are provided by Yang and Raine and by Blair and colleagues, respectively. In Chapter 19, Frick and Marsee address the critical importance of development to an understanding of psychopathy and consider how the inclusion of a new "limited prosocial emotions" specifier for the diagnosis of child conduct disorder in DSM-5 can help to advance knowledge in this area. Additionally, Part IV includes a chapter I contributed on cognitive and emotional processing in psychopathy. My aim in writing this chapter was to assist the reader in relating material covered in this part of the book to concepts and findings presented in earlier parts. To accomplish this, I use basic biobehavioral processes of inhibitory control, defensive ("fear") reactivity, and empathic sensitivity as conceptual referents for tying together foundational ideas about psychopathy (Part I), evidence pertaining to its separable facets (Part II), and what we know about the properties and correlates of these facets (Part III) with existing research on the causal origins of these symptom facets and their neurobiological bases (Part IV).

Part V of this handbook focuses on psychopathy in distinct populations of individuals. Four of the five chapters here are substantially revised versions of ones from the first edition. In Chapter 20, Salekin, Andershed, and Clark discuss conceptual issues in studying psychopathy in younger samples and describe available assessment methods for use with children and adolescents. The next chapter by Verona and Vitale describes differences in the clinical expression and correlates of psychopathy in women as compared to men, with particular emphasis on newer research findings, and discusses causal explanations for these differences. In Chapter 22, Fanti and his coauthors provide detailed coverage of the literature on cultural and ethnic differences in psychopathy, with particular attention to the rapidly growing body of work on psychopathy in countries outside of North America. Chapter 23, by Hickey and colleagues, addresses the role of psychopathy in one of the most savage and disturbing forms of criminal deviance: serial murder. As a leading psychological expert in this area and author of the acclaimed 2016 textbook Serial Murderers and Their Victims, Hickey brings unique perspective to this topic. His chapter presents evidence challenging the widely held idea that most serial murderers are clinically psychopathic. In Chapter 24, Benning, Venables, and Hall discuss the intriguing concept of "successful psychopathy" from alternative conceptual standpoints, including the triarchic model framework.

Part VI focuses on clinical and applied issues, including psychopathy in specialized clinical samples, its use in risk assessments, approaches to treatment, and legal-ethical issues. Two chapters in this section are completely new. One of these, Chapter 26, by Ellingson and collaborators, surveys the literature on psychopathy and substance use disorders, with particular emphasis on the idea of an externalizing spectrum encompassing proneness to substance abuse and impulsive-antisocial behavior along with disinhibitory traits (see also Nelson & Foell, Chapter 6). The other, Chapter 29, by Polaschek and Skeem, reviews the latest research findings pertaining to treatment of antisocial-psychopathic offenders and discusses challenges to improving treatment effectiveness along with ways to address these challenges. Chapters 25 and 27 focus on psychopathy in relation to specific types of offending. Porter, Woodworth, and Black discuss how psychopathy and its facets relate to violent behavior, with coverage of recent work on motives for violence, offender perceptions of aggressive acts, and suicidal behavior conceptualized as aggression against oneself. Knight and Guay update their conceptual model of psychopathy and coercive sexual offending, detailed in the first edition of this handbook, by reviewing findings relevant to the model that have accrued since then. Chapter 28, by Douglas, Vincent, and Edens, and Chapter 30, by Edens, Petrila, and Kelley, focus (respectively) on the utility of psychopathy and its subdimensions as predictors of criminal reoffending and on legal and ethical issues surrounding assessments of psychopathy in forensic contexts and its use in clinical decision making.

The handbook ends with a discussion of "future directions" (Chapter 31) by three prominent young scholars in the psychopathy field (Wygant, Pardini, and Marsh), along with me. Whereas the first edition ended with a discussion of Cleckley's ideas about psychopathy, this edition begins with coverage of Cleckley's conceptualization and concludes with a vision of how research in the psychopathy area can progress toward a comprehensive, process-based understanding with clear implications for prevention and treatment. In his section of this concluding chapter, Wygant identifies key directions for research on assessment, with particular attention to the trait-dimensional system for personality disorders in DSM-5 and the NIMH RDoC framework and to the ways in which research on psychopathy can interface with these new systems. Following this, Pardini discusses major unresolved issues in the developmental literature on psychopathy that call for systematic research, including questions about initial emergence and temporal stability of psychopathic features, gaps in our understanding of etiological influences, and uncertainties regarding the effectiveness of existing interventions. Marsh then describes the importance of neuroimaging methods for advancing our understanding of brain processes related to psychopathic traits and behavior and highlights key issues in research of this type, including replicability, real-world utility of findings, and ethical questions. Drawing on the perspectives provided by Wygant, Pardini, and Marsh, along with ideas and issues discussed by other contributors to this volume, my closing portion of this chapter proposes a coordinated agenda for continuing research in the field.

Compared to other books on psychopathy, this edition of the Handbook of Psychopathy remains unique in terms of scope, comprehensiveness, and currency of coverage. Given its emphasis on empirical findings, this handbook will be of particular interest to research-oriented academicians and their students, as well as researchers in other settings with interests in crime, antisocial behavior, violence, and related problems including personality disorders, substance addictions, and suicidality. In addition, because of the coverage it provides of issues and procedures relevant to clinical assessment, specialized populations, and therapeutic intervention, this handbook can serve as a valuable resource for mental health providers in correctional settings and for psychologists, psychiatrists, and counselors working with offenders and substance abuse clientele in other contexts. Given its coverage of assessment-related topics and important legal and ethical issues, this handbook will also be of value to forensic psychologists/psychiatrists and criminal law professionals.

Contrary to what I had anticipated, this new edition of the Handbook took substantially more energy and effort to complete than the first. However, I find the product substantially more satisfying as a result, and hope readers will feel the same way. I benefited in my efforts from the support and assistance of many different people. The Army Research Institute of the U.S. Department of Defense has provided generous support for my scholarly activities since 2014—specifically, through research Grant No. W911NF-14-1-0018. My thanks go out to the Institute's director, Dr. Jay Goodwin; my project officer, Dr. Andrew Slaughter; and Institute staff members Drs. Gregory Ruark and Stefanie Plemmons. I am grateful to my editor at The Guilford Press, Jim Nageotte, for his valuable input at various stages of the project, and to Senior Assistant Editor Jane Keislar, who contributed in many ways to its completion and demonstrated extraordinary patience throughout the process. I am indebted as well to current members of my lab group who have contributed to the work reported in my chapters and assisted my efforts in other ways, including Dr. Jens Foell (coauthor of Chapter 6), Colin Bowyer, Sarah Brislin, Keanan Joyner, Emily Perkins, Casey Strickland, and James Yancey. I also wish to thank former members of my laboratory group, a number of whom have contributed to this volume-namely, Isabella Palumbo and Drs. Stephen Benning, Laura Drislane, Jason Hall, Brian Hicks, Lindsay Nelson, Elizabeth Sullivan, Noah Venables, Edelyn Verona, and Bethany Walters. I am grateful also to the many other contributors to this volume, and give special thanks to my former PhD advisor William Iacono; longtime collaborators Kevin Douglas, John Edens, Scott Lilienfeld, and Martin Sellbom; and other research collaborators including Henrik Andershed, James Blair, Kostas Fanti, Kathryn Fowler, Paul Frick, Robert Latzman, Devon Polaschek, Randy Salekin, Jennifer Skeem, Sarah Francis Smith, Ashley Watts, and Dustin Wygant. I acknowledge as well the critical inspiration provided to me over the course of my career by contributors David Lykken, Robert Hare, and Don Fowles. Finally, I owe an extra special debt of gratitude to my wife, Deb, and daughters, Liliah and Sarah, for the love, support, and patience they have shown me day in and day out.

The study of psychopathy has a rich history and occupies a central role in the clinical assessment

and experimental psychopathology literatures. This new edition of the *Handbook* showcases the innovative and important work that continues to be done in this area, and—through its focus on core traits and processes underlying the observable symptoms of psychopathy—presents a vision of how further research on psychopathy can help to advance our understanding of mental disorders as a whole. It is hoped that this new edition will serve as a source of inspiration for the next generation of scholars who stand poised to realize this vision.

#### REFERENCES

- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: Author.
- Andershed, H., Kerr, M., Stattin, H., & Levander, S. (2002). Psychopathic traits in non-referred youths: A new assessment tool. In E. Blauuw & L. Sheridan (Eds.), Psychopaths: Current international perspectives (pp. 131–158). The Hague, The Netherlands: Elsevier.
- Cleckley, H. (1976). *The mask of sanity* (5th ed.). St. Louis, MO: Mosby. (Original work published 1941)
- Cooke, D. J., Hart, S. D., Logan, C., & Michie, C. (2012). Explicating the construct of psychopathy: Development and validation of a conceptual model, the Comprehensive Assessment of Psychopathic Personality (CAPP). International Journal of Forensic Mental Health, 11, 242–252.
- Drislane, L. E., Patrick, C. J., & Arsal, G. (2014). Clarifying the content coverage of differing psychopathy inventories through reference to the Triarchic Psychopathy Measure. *Psychological Assessment*, 26, 350–362.
- Hare, R. D. (2003). The Hare Psychopathy Checklist— Revised (2nd ed.). Toronto: Multi-Health Systems.
- Hare, R. D., & Neumann, C. S. (2008). Psychopathy as a clinical and empirical construct. Annual Review of Clinical Psychology, 4, 217–246.
- Hare, R. D., & Neumann, C. S. (2010). The role of antisociality in the psychopathy construct: Comment on Skeem and Cooke (2010). *Psychological Assessment*, 22, 446–454.
- Hickey, E. W. (2016). Serial murderers and their victims (7th ed.). New York: Wadsworth.
- Insel, T., Cuthbert, B., Garvey, M., Heinssen, R., Pine, D., Quinn, K., et al. (2010). Research Domain Criteria (RDoC): Toward a new classification framework for research on mental disorders. *American Journal of Psychiatry*, 167, 748–751.

- Kotov, R., Krueger, R. F., Watson, D., Achenbach, T. M., Althoff, R. R., Bagby, M., et al. (2017). The Hierarchical Taxonomy Of Psychopathology (HiTOP): A dimensional alternative to traditional nosologies. *Journal of Abnormal Psychology*, 126, 454–477.
- Kozak, M. J., & Cuthbert, B. N. (2016). The NIMH Research Domain Criteria initiative: Background, issues, and pragmatics. *Psychophysiology*, 53, 286–297.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment*, 66, 488–524.
- Lilienfeld, S.O., & Widows, M. R. (2005). The Psychopathic Personality Inventory—Revised (PPI-R). Lutz, FL: Psychological Assessment Resources.
- Lynam, D., Gaughan, E., Miller, J., Miller, D., Mullins-Sweatt, S., & Widiger, T. (2011). Assessing the basic traits associated with psychopathy: Development and validation of the Elemental Psychopathy Assessment. *Psychological Assessment*, 23, 108–124.
- Patrick, C. J., & Drislane, L. E. (2015). Triarchic model of psychopathy: Origins, operationalizations, and observed linkages with personality and general psychopathology. *Journal of Personality*, 83, 627–643.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, 21, 913–938.
- Paulhus, D. L., Neumann, C. S., Hare, R. D., Williams, K. M., & Hemphill, J. F. (2016). Self-Report Psychopathy Scale (4th ed.). Toronto: Multi-Health Systems.
- Sadler, J. Z. (2006). Review—Handbook of Psychopathy. Metapsychology Online Reviews, 10, 1–2. Retrieved from http://metapsychology.mentalhelp.net/ poc/view\_doc.php?type=book&id=3110&cn=393.
- Skeem, J. L., & Cooke, D. J. (2010a). Is criminal behavior a central component of psychopathy?: Conceptual directions for resolving the debate. *Psychological Assessment*, 22, 433–445.
- Skeem, J. L., & Cooke, D. J. (2010b). One measure does not a construct make: Directions toward reinvigorating psychopathy research—Reply to Hare and Neumann (2010). Psychological Assessment, 22(2), 455–459.
- Skeem, J. L., Polaschek, D. L. L., Patrick, C. J., & Lilienfeld, S. O. (2011). Psychopathic personality: Bridging the gap between scientific evidence and public policy. Psychological Science in the Public Interest, 12, 95–162.
- Venables, N. C., Hall, J. R., & Patrick, C. J. (2014). Differentiating psychopathy from antisocial personality disorder: A triarchic model perspective. *Psychological Medicine*, 44, 1005–1013.

### Contents

### PART I. THEORETICAL AND EMPIRICAL FOUNDATIONS OF PSYCHOPATHY

1.	Psychopathy as Masked Pathology CHRISTOPHER J. PATRICK	3
2.	Psychopathy, Sociopathy, and Antisocial Personality Disorder DAVID T. LYKKEN	22
	<b>COMMENTARY.</b> A Minnesota Perspective on Lykken's "Psychopathy, Sociopathy, and Antisocial Personality Disorder" WILLIAM G. IACONO	33
3.	The PCL-R Assessment of Psychopathy: Development, Properties, Debates, and New Directions ROBERT D. HARE, CRAIG S. NEUMANN, and ANDREAS MOKROS	39
4.	The Response Modulation Hypothesis: Formulation, Development, and Implications for Psychopathy RACHEL BENCIC HAMILTON and JOSEPH P. NEWMAN	80
5.	Temperament Risk Factors for Psychopathy DON C. FOWLES	94

### PART II. DISTINCT PHENOTYPIC FACETS OF PSYCHOPATHY

6.	Externalizing Proneness and Psychopathy	127
	LINDSAY D. NELSON and JENS FOELL	

xvii	i Contents		
7.	7. Callous–Unemotional Traits ESSI VIDING and EVA R. KIMONIS		
8.	Boldness: Conceptual and Methodological Issues SCOTT O. LILIENFELD, ASHLEY L. WATTS, SARAH FRANCIS SMITH, and ROBERT D. LATZMAN	165	
	PART III. ASSESSMENT AND DIAGNOSIS OF PSYCHOPATHY		
9.	Capturing Psychopathic Personality: Penetrating the Mask of Sanity through Clinical Interview DAVID J. COOKE and CAROLINE LOGAN	189	
10.	The Self-Report Assessment of Psychopathy: Challenges, Pitfalls, and Promises MARTIN SELLBOM, SCOTT O. LILIENFELD, KATHERINE A. FOWLER, and KRISTEN I. McCRARY	211	
11.	Psychopathy and Personality: An Articulation of the Benefits of a Trait-Based Approach DONALD R. LYNAM, JOSHUA D. MILLER, and KAREN J. DEREFINKO	259	
12.	Psychopathy and DSM-5 Psychopathology THOMAS A. WIDIGER and CRISTINA CREGO	281	
13.	Variants ("Subtypes") of Psychopathy BRIAN M. HICKS and LAURA E. DRISLANE	297	
	PART IV. ETIOLOGY AND MECHANISMS OF PSYCHOPATHY		
14.	Genetic and Environmental Influences on Psychopathy and Antisocial Behavior IRWIN D. WALDMAN, SOO HYUN RHEE, DEVON LoPARO, and YUNSOO PARK	335	
15.	Family Background and Psychopathy DAVID P. FARRINGTON and HENRIETTE BERGSTRØM	354	
16.	The Neuroanatomical Bases of Psychopathy: A Review of Brain Imaging Findings YALING YANG and ADRIAN RAINE	380	
17.	Psychopathy and Brain Function: Insights from Neuroimaging Research R. JAMES R. BLAIR, HARMA MEFFERT, SOONJO HWANG, and STUART F. WHITE	401	
18.	Cognitive and Emotional Processing in Psychopathy CHRISTOPHER J. PATRICK	422	

	Contents	xix
19.	Psychopathy and Developmental Pathways to Antisocial Behavior in Youth PAUL J. FRICK and MONICA A. MARSEE	456
	PART V. PSYCHOPATHY IN SPECIFIC SUBPOPULATIONS	
20.	Psychopathy in Children and Adolescents: Assessment and Critical Questions Regarding Conceptualization RANDALL T. SALEKIN, HENRIK ANDERSHED, and ABBY P. CLARK	479
21.	Psychopathy in Women: Assessment, Manifestations, and Etiology EDELYN VERONA and JENNIFER VITALE	509
22.	Cultural and Ethnic Variations in Psychopathy KOSTAS A. FANTI, ALEXANDROS LORDOS, ELIZABETH A. SULLIVAN, and DAVID S. KOSSON	529
23.	Deviance at Its Darkest: Serial Murder and Psychopathy ERIC W. HICKEY, BETHANY K. WALTERS, LAURA E. DRISLANE, ISABELLA M. PALUMBO, and CHRISTOPHER J. PATRICK	570
24.	Successful Psychopathy STEPHEN D. BENNING, NOAH C. VENABLES, and JASON R. HALL	585
	PART VI. CLINICAL AND APPLIED ISSUES IN PSYCHOPATHY	
25.	Psychopathy and Aggression STEPHEN PORTER, MICHAEL T. WOODWORTH, and PAMELA J. BLACK	611
26.	Psychopathy and Substance Use Disorders JARROD M. ELLINGSON, ANDREW K. LITTLEFIELD, ALVARO VERGÉS, and KENNETH J. SHER	635
27.	The Role of Psychopathy in Sexual Coercion against Women: An Update and Expansion RAYMOND A. KNIGHT and JEAN-PIERRE GUAY	662
28.	Risk for Criminal Recidivism: The Role of Psychopathy KEVIN S. DOUGLAS, GINA M. VINCENT, and JOHN F. EDENS	682
29.	Treatment of Adults and Juveniles with Psychopathy DEVON L. L. POLASCHEK and JENNIFER L. SKEEM	710
30.	Legal and Ethical Issues in the Assessment and Treatment of Psychopathy JOHN F. EDENS, JOHN PETRILA, and SHANNON E. KELLEY	732

### Contents

### PART VII. CONCLUSIONS AND FUTURE DIRECTIONS

31.	Understanding Psychopathy: Where We Are, Where We Can Go DUSTIN B. WYGANT, DUSTIN A. PARDINI, ABIGAIL A. MARSH, and CHRISTOPHER J. PATRICK	755
	Author Index	779
	Subject Index	803

### PART I

### THEORETICAL AND EMPIRICAL FOUNDATIONS OF PSYCHOPATHY

### CHAPTER 1

### Psychopathy as Masked Pathology

### CHRISTOPHER J. PATRICK

[I]t is a different kind of abnormality from all those now recognized as seriously impairing competency. . . . The first and most striking difference is this: . . . The observer is confronted with a convincing mask of sanity. All the outward features of this mask are intact. . . . —CLECKLEY (1976, p. 368)

he cited quotation, from the fifth (1976) edition of Hervey Cleckley's book The Mask of Sanity (originally published in 1941), captures what Cleckley considered the most salient feature of psychopathy as a major psychiatric condition: It entails a highly credible appearance of psychological normality ("sanity") that operates to conceal ("mask") a severe underlying pathology that is manifested in reckless, unrestrained behavior across multiple areas of life. The passage of the book containing this quotation contrasts the coherent thought processes of psychopathic individuals with the confused, disrupted cognitive style of patients with schizophrenia; additionally, it characterizes psychopathic individuals as showing ostensibly healthy "verbal and facial expressions, tones of voice, and all the other signs . . . implying conviction and emotion and the normal experiencing of life," along with verbal "judgments of value and emotional appraisals [that appear] sane and appropriate" (p. 369). Elsewhere in his book, Cleckley amplifies this "mask" conception by identifying the following as defining features of psychopathy: a positive social demeanor marked by affability and agreeableness ("Alert and friendly in his attitude, he is easy to talk with and seems to have a good many genuine interests"; p. 339); a salient absence of anxiety or internalizing symptoms ("[T]he psychopath is nearly always free from minor reactions popularly regarded as 'neurotic' or constituting 'nervousness'"; p. 339); and a disinclination toward suicide ("Instead of a predilection for ending their own lives, psychopaths . . . show much more evidence of a specific and characteristic immunity from such an act"; p. 359).

The mask component of psychopathy is arguably its most distinctive feature as a clinical condition, and without question a major source of its enduring fascination. The idea that there are reckless, untrustworthy individuals in our midst who present as psychologically normal (cf. Hare, 1993) is both disturbing and intriguing. This idea connects in turn with the notion of the artful trickster, a recurring image in stories and legends throughout history and across cultures of the world, which Jung (1963) recognized as a core thematic element (archetype) of the human psyche. Additionally, it relates to the concept of a primitive-instinctual "id" (Freud, 1923/1961) or "shadow" (Jung, 1963) side within each of us that operates in counterpoint to our rational-prosocial tendencies.

In this chapter, I discuss the mask component of psychopathy in relation to historic accounts of this condition, and contemporary theoretical and empirical work in this area. I consider the mask component hand in hand with the "madness" features described by Cleckley (1941/1976) and others, and suggest alternative ways in which these two contrasting "faces" of psychopathy might relate to one another. In doing so, I foreshadow major themes addressed in other chapters of this book and highlight interesting new directions for research that emerge out of the concept of psychopathy as masked pathology.

### Origins and Development of the "Mask" Concept

The idea of psychopathy as a distinct psychiatric illness marked by serious behavioral deviancy in the context of intact rational function is commonly traced to Pinel (1806/1962), who documented a condition he labeled manie sans délire (mania without delirium). However, in contrast with Cleckley's (1941/1976) illustrative cases (discussed below), the dominant characteristic in Pinel's clinical examples was explosively violent behavior ("abstract and sanguinary fury")-and, indeed, one of his three sample cases would likely meet criteria for intermittent explosive disorder according to current diagnostic guidelines (American Psychiatric Association [APA], 2013), rather than psychopathy or antisocial personality disorder. Cases more akin to those of Cleckley were documented by subsequent psychiatric scholars. Kraepelin (1904/1915), for example, identified a group of patients termed "swindlers," who exhibited salient charm and persuasiveness but were amoral, untrustworthy, and devoid of loyalty; they commonly specialized in con artistry and fraud, and accrued large debts they failed to pay. Along similar lines, Schneider (1934) documented a "selfseeking" type whom he characterized as pleasant and congenial in demeanor but selfish, attentionseeking, and superficial in emotional reactions and social relations; like Kraepelin's (1904/1915) swindlers, individuals of this type were pervasively deceitful and prone to acts of fraud.

At the same time, it should be noted that both Kraepelin (1904/1915) and Schneider (1934) applied the term "psychopathic" to a range of other clinical conditions beyond these—in Kraepelin's case, to chronic conditions marked by "moral defect" that he presumed to be biologically based, including hostile–impulsive ("quarrelsome"), persistent antisocial ("born criminal"), and addictiondriven ("compulsive") types, along with so-called "swindlers"; and in Schneider's case, to deviant personality or "characterological" conditions ranging from hypochondriacal ("asthenic") to submissive ("weak-willed") to deceptive-antisocial types (i.e., impulsive-aggressive ["explosive"] and callous-predatory ["affectionless"] types, along with the self-seeking variant). The use of the label "psychopathic" by these authors for conditions of such different types highlights a major problem in the literature up to the time of Cleckley (1941/1976) namely, the tendency on the part of clinicians and scholars to apply the term so broadly as to render it meaningless. This problem was exemplified in the writings of British physician J. C. Pritchard (1835) and German psychiatrist J. L. Koch (1891), who grouped conditions as diverse as substance addictions, sexual paraphilias, mood disorders, psychosis, and intellectual disability into the category of "moral insanity" or "psychopathic inferiority."

A major goal of Cleckley's in writing the Mask of Sanity (1941/1976) was to counter this excessively broad use of the term:

It is my earnest conviction that, traditionally confused with a fairly heterogeneous group under a loose and variously understood term, a type of patient exists who could, without exaggeration, still be called the forgotten man of psychiatry (p. 16). The chief aim of this book is to help... bring patients with this type of disorder into clearer focus so that psychiatric efforts to deal with their problems can eventually be implemented. (p. 23)

Focusing on cases encountered in his practice within a large psychiatric hospital, Cleckley (1941/1976) sought to establish more precise usage of the term by presenting detailed descriptions of the demeanor and actions of various patients he considered psychopathic (n = 15), formulating explicit criteria for diagnosing the disorder based on these case examples, and highlighting distinctions between psychopathy and other psychiatric conditions (including ones previously classed with it). In the concluding chapter of the first edition of this volume, I (Patrick, 2006) summarized salient characteristics of the cases presented by Cleckley, noting in particular that (1) lack of anxiousness was clearly evident in most of these cases; (2) hostile-aggressive behavior was a dominant feature in only a small number of them; and (3) other types of law-breaking behavior (e.g., fraud, theft, forgery, fire setting, drug offenses, drunken/disorderly conduct, vandalism, truancy, reckless driving) were evident in all cases—but marked by a peculiar aimless ("inadequately motivated") quality: "He will commit theft, forgery, adultery, fraud, and other deeds for astonishingly small stakes and under much greater risks of being discovered than will the ordinary scoundrel. He will, in fact, commit such deeds in the absence of any apparent goal at all" (p. 343).

In my closing chapter of the first edition of this handbook, I also discussed Cleckley's (1941/1976) 16 diagnostic criteria for psychopathy, grouping them into three thematic categories (see Table 1.1). The first category consists of the "mask" features that set psychopathy apart from other psychiatric conditions: good intelligence and social charm; absence of nervousness; absence of delusions/irrationality; and suicide rarely carried out (Table 1.1, top part). Of note, in describing these features, Cleckley referred to not only an absence of visible symptoms of mental illness but also the presence of social poise and emotional stability: "The surface of the psychopath . . . shows up as

TABLE 1.1. Categorization of Cleckley's (1941/1976) 16 Diagnostic Criteria for Psychopathy

Item category	Item	number and descriptive label	
Mask features	1. 5	Superficial charm and good 'intelligence"	
	2. 4	Absence of delusions and other signs of irrational thinking	
	3. 1	Absence of "nervousness" or psychoneurotic manifestations	
	14. 3	Suicide rarely carried out	
Behavioral deviance	7. ] 1	Inadequately motivated antisocial behavior	
features	8. ] 1	Poor judgment and failure to learn by experience	
	4. 1	Unreliability	
	13. I	Fantastic and uninviting behavior with drink and sometimes without	
	15. S	Sex life impersonal, trivial, and poorly integrated	
	16. l	Failure to follow any life plan	
Shallow-	5. 1	Untruthfulness and insincerity	
deceptive	6. l	Lack of remorse or shame	
features	10. (	General poverty in major affective reactions	
	9. ] i	Pathological egocentricity and incapacity for love	
	11. 5	Specific loss of insight	
	12. I	Unresponsiveness in general interpersonal relations	

equal to or better than normal and gives no hint at all of a disorder within. Nothing about him suggests oddness, inadequacy, or moral frailty. His mask is that of robust mental health" (p. 383).

However, this overt appearance of robust mental health is accompanied by persistent and severe behavioral deviancy: "The psychopath, however perfectly he mimics man theoretically, that is to say, when he speaks for himself in words, fails altogether when he is put into the practice of actual living. His failure is so complete and so dramatic that it is difficult to see how such a failure could be achieved by anyone less defective than a downright madman" (Cleckley, 1941/1976, p. 370). This behavioral deviancy aspect of the disorder is captured by a second set of indicators, including impulsive antisocial acts, irresponsibility (unreliability), promiscuity, and absence of any clear life plan (Table 1.1, middle part). Along with the "mask" and behavioral deviance features, Cleckley's criteria for psychopathy also included a third set of features pertaining to affective/social shallowness and deceptiveness, including general poverty of affect, absence of remorse, inability to love, and lack of loyalty or social reciprocity, along with untruthfulness/insincerity (Table 1.1, bottom part).

In the context of specifying these central defining features, Cleckley (1941/1976) discusses in detail how psychopathy differs from other psychiatric conditions, in a section of his book titled "A Comparison with Other Disorders." He notes that psychopathic individuals are free from the salient cognitive-perceptual disturbances seen in psychotic patients ("There are no demonstrable defects in theoretical reasoning. . . . He carries out his activities [with] ordinary awareness of the consequences and without the distorting influences of any demonstrable system of delusions"; p. 247) and do not exhibit the social awkwardness/detachment or hostile suspiciousness seen in schizoid and paranoid personality conditions, respectively. In contrast with anxious-depressive (psychoneurotic) patients, psychopathic patients are energetic, socially assertive, and "very sharply characterized by the lack of anxiety (remorse, uneasy anticipation, apprehensive scrupulousness, the sense of being under stress or strain) and, less than the average person, show what is widely regarded as basic in the neurotic" (p. 257, emphasis added). Relative to individuals with substance problems or sexual paraphilias, psychopathic individuals are not oriented toward specific hedonistic pursuits and exhibit more wide-ranging behavioral deviancy.

Importantly, Cleckley (1941/1976) also differentiates psychopathy from other forms of criminality and antisocial deviance. In contrast with typical repeat offenders ("ordinary criminals"), psychopathic individuals lack clear motivation for much of their antisocial behavior, fail to gain systematically from such behavior, harm others inadvertently rather than on purpose, and rarely "commit murder or other offenses that promptly lead to major prison sentences" (p. 262). Cleckley likewise distinguishes psychopathic deviancy from "normal delinquency" in terms of its pervasiveness across situations, persistence over time, and extent of adverse effects on the individual's life.

Having characterized psychopathy in these diagnostic terms and distinguished it from other psychiatric disorders, Cleckley (1941/1976) highlights with particular emphasis the unusual, incongruous nature of this condition:

The observer is confronted with a paradox within the already baffling domain of mental disorder. . . . A man who is sane by the standards of psychiatry, aware of all the facts which we ourselves recognize, and free from delusions but who conducts himself in a way quite as absurd as many of the psychotic. . . . (p. 367)

Only very slowly and by a complex estimation or judgment based on multitudinous small impressions does the conviction come upon us that, despite these intact rational processes, these normal emotional affirmations, and their consistent application in all directions, we are dealing here not with a complete man at all but with something that suggests a subtly constructed reflex machine which can mimic the human personality perfectly. (p. 369)

Furthermore, and of importance, Cleckley (1941/1976) expresses the view that psychopathic individuals are themselves largely unaware of how discrepant their day-to-day conduct is from the social image they present to others. More specifically, Cleckley suggests that the process that underlies their convincing mask of sanity—"a consistent leveling of [emotional] response to petty ranges" (p. 383)—operates as a barrier to objective self-appraisal (i.e., insight):

Without suffering or enjoying in significant degree the integrated emotional consequences of experience, the psychopath will not learn from it to modify and direct his activities as other men whom we call sane modify and direct theirs. He will lack the real driving impulses which sustain and impel others toward their various widely differing but at least subjectively important goals. He will naturally lack insight into how he differs from other men, for of course he does not differ from other men as he sees them. It is entirely impossible for him to see another person from the aspect of major affective experience, since he is blind to this order of things or blind in this mode of awareness. (p. 373)

Cleckley's (1941/1976) concept of psychopathy as masked pathology has been enormously influential over the decades since his classic book was first published. Of particular importance, his conceptualization (1) resulted in a rapid shift in the use of the term "psychopathic," from a generic label for diverse psychiatric conditions to one designating a distinct pathology marked by unique clinical features, and (2) fostered a general recognition that antisocial or criminal behavior is not sufficient in itself for a diagnosis of psychopathy. Echoing Cleckley's latter point, Karpman (1941, 1948) advanced the notion of "primary" versus "secondary" psychopathy: "Many of even the most recalcitrant psychopaths are nothing but neurotics, meaning that the reactions flow out from unresolved inner conflicts. . . . In my experience, the symptomatic or secondary psychopath furnishes about 85 per cent of what is diagnosed or passes for psychopathy or psychopathic personality. The remaining 15 per cent I put in a special group which I designate as primary, idiopathic, or essential psychopathy" (1948, p. 487). In a related vein, Lykken (1957) classified young antisocial offenders into primary versus secondary subgroups using Cleckley's (1941/1976) diagnostic criteria and presented experimental evidence that the two groups differed in anxiousness and capacity for fear-an idea that received extensive support from subsequent laboratory-experimental studies by Hare (e.g., 1965a, 1965b, 1978) that also used Cleckley's criteria to identify psychopathic offenders.

### The "Madness" Component of Psychopathy

The most visible expression of the underlying "madness" of psychopathy according to Cleckley (1941/1976) was a pervasive unrestrained behavioral style that produces severe adverse consequences both for the psychopathic patient and others associated with him or her (Table 1.1, middle portion). Cleckley asserted that information regarding the patient's behavior in various spheres of life outside the clinic setting, gained through direct observation and reports of knowledgeable associates, as well as discussions with the patient, is necessary to appreciate the severe pathology concealed by the "mask": "The disorder can be demonstrated only when the patient's activity meshes with the problems of ordinary living. . . . To see [psychopathic individuals] properly . . . we must follow them from the wards out into the marketplace, the saloon, and the brothel, to the fireside, to church, and to their work." (p. 22–23). Cleckley's clinical case histories were written to provide this perspective. Each case includes extensive compelling examples of the reckless, capricious, and irresponsible behavior that Cleckley described as the most salient manifestation of the "madness" of psychopathy:

He seems to go out of his way to make a failure of life. . . . He eventually cuts short any activity in which he is succeeding, no matter whether it is crime or honest endeavor. . . . His behavior gives such an impression of gratuitous folly and nonsensical activity in such massive accumulation that it is hard to avoid the conclusion that here is the product of true madness—of madness in a sense quite as real as that conveyed to the imaginative layman by the terrible word lunatic. (p. 364)

Of note, though Cleckley (1941/1976) characterized psychopathy in its full form as a severely debilitating condition, he also presented case examples of psychopathic individuals who managed to achieve and maintain successful functioning in the community (e.g., "The psychopath as businessman"; "The psychopath as scientist"; "The psychopath as physician"; and "The psychopath as psychiatrist"). He referred to such cases as "incomplete manifestations or suggestions of the disorder" (p. 188). By "incomplete," he meant that the core underlying disturbance, while present, was not expressed in a seriously maladaptive behavioral manner: "The psychopathologic process . . . is, as with the [full clinical cases], a process affecting basic personal reactions; but here it has not altogether dominated the scene. It has not crowded ordinary successful functioning in the outer aspects of work and social relations entirely out of the picture" (p. 189). However, as discussed in the preceding section, Cleckley also made it clear that the presence of reckless, antisocial behavior does not in itself warrant the diagnosis: "There are many patients who show relatively circumscribed antisocial behavior or temporary episodes of gross, general delinquency, who have . . . much less in common with the obvious psychopath than those who make a better outward impression but who consistently show signs of inner subjective reactions typical of the clinically disabled patient" (pp. 190-191). In summary, therefore, Cleckley viewed reckless, unrestrained, and often self-defeating (as well as other-damaging) conduct as symptomatic of the underlying pathological process in psychopathy, and highly typical of psychopathic individuals residing in general inpatient and forensic settings.

Contemporary clinical-psychological research has established a specific diagnostic label for problematic conduct of this type: "externalizing behavior." In work dating back 50 years, Achenbach (1966) reported results from a factor analysis of childhood psychopathology symptoms that revealed the presence of two major dimensions of symptomatology, which he labeled "internalizing" and "externalizing" (see also Achenbach & Edelbrock, 1978). The internalizing factor was marked by symptoms including fears/phobias, worry, depression, shyness/social withdrawal, obsessions, compulsions, and somatic complaints (e.g., stomachaches, other pain); the externalizing factor was associated with symptoms including disobedience, truancy, running away, lying, swearing, stealing, fighting, vandalism/destructiveness, and "sexual delinquency." Subsequent work has demonstrated a highly similar two-dimensional structure for common adult forms of psychopathology, in which anxious-depressive disorders (or their symptoms) demarcate a higher-order internalizing factor, and impulsive-antisocial and substance use disorders/ symptoms demarcate a broad externalizing factor (Krueger, 1999; Krueger, Caspi, Moffitt, & Silva, 1998; Krueger, McGue, & Iacono, 2001). The externalizing problem domain, which connects clearly with the behavioral tendencies exhibited by Cleckley's (1941/1976) prototypical clinical cases, has also been termed the "disinhibitory" spectrum of psychopathology (e.g., Gorenstein & Newman, 1980; Sher & Trull, 1994). Behavior-genetic research using twin participants has demonstrated that the general tendency to exhibit problems of this type reflects a continuously varying, etiologically coherent trait liability with very high (~80%) heritability (Krueger et al., 2002).

The idea of a general spectrum of psychopathology encompassing impulse control problems of various types is helpful for understanding why the term "psychopathy" has been applied to such a broad range of conditions historically. Externalizing forms of psychopathology are clinically salient, relatively common, and co-occur frequently with one another—so that unrestrained antisocial behavior of the sort described by Cleckley (1941/1976) is often seen in individuals with substance problems or other impulse-related conditions distinct from psychopathy (e.g., pathological gambling, sexual deviancy, borderline personality).

However, while externalizing behavior is highly characteristic of clinically psychopathic individuals, persons who exhibit behavior of this type differ as a whole from individuals described as psychopathic by Cleckley (1941/1976). In particular, externalizing symptomatology is generally associated with (1) increased rather than decreased levels of internalizing symptomatology (i.e., internalizing and externalizing factors of psychopathology are correlated to a moderate positive degree; Achenbach & Edelbrock, 1978; Krueger, 1999; see also Vaidyanathan, Patrick, & Iacono, 2011), (2) higher rather than lower scores on scale measures of anxiousness, neuroticism, and negative emotionality (e.g., Ellingson, Littlefield, Vergés, & Sher, Chapter 26, this volume; Krueger, Caspi, Moffitt, Silva, & McGee, 1996; Sher & Trull, 1994), and (3) increased risk for suicidal ideation and action (Verona & Patrick, 2000; Verona, Sachs-Ericsson, & Joiner, 2004).<sup>1</sup> From this perspective, the psychopathic individuals that Cleckley described are markedly anomalous: They exhibit severe impulsive-externalizing behavior without accompanying internalizing psychopathology and are notably lacking in anxiety or neuroticism, as opposed to high in these traits. Additionally, in Cleckley's words, they show a "specific and characteristic immunity" to suicidal behavior. Thus, the "mask" features identified at the beginning of this chapter as most central to Cleckley's conception are the characteristics that differentiate highly psychopathic individuals most clearly from other individuals who exhibit salient externalizing tendencies.

Below, I consider some alternative ways to think about the relationship between the "mask" features of psychopathy as Cleckley conceptualized it, and the reckless–externalizing behavior he described as the most conspicuous expression of the "madness" associated with it. First, however, I describe an alternative perspective on psychopathy that emerged out of the criminological literature of the mid-1900s—one that emphasizes callous–aggressive tendencies more than charming insouciance.

### Predatory Criminality versus Masked Psychopathology

An alternative conceptualization evident in historic writings is of psychopathy as an asocial, predatory form of criminal deviancy. In contrast with Cleckley's (1941/1976) portrayal of psychopathic hospital patients as affable and socially adept but aimless and untrustworthy, writers concerned with psychopathy in criminal populations highlighted features of emotional detachment, abrasiveness, and aggressive exploitativeness toward others. Lindner (1944), for example, characterized criminal psychopaths as hostile, defiant, and combative. McCord and McCord (1964), in their book The Psychopath: An Essay on the Criminal Mind, emphasized tendencies toward affective coldness, social disconnectedness, and dangerousness, along with lack of behavioral control. Like Cleckley (1941/1976), these authors described psychopathic offenders as low in anxiety and emotional sensitivity, but saw these qualities as reflections of social disengagement and unconcern ("lovelessness" and "guiltlessness") rather than of a general affective deficit: Lacking in social conscience and inhibitions against aggression, offenders of this type are prone to react with rage rather than fear under circumstances of frustration or threat.

Lee Robins (1966, 1978) also emphasized early and persistent aggressive antisocial deviance in her empirical accounts of maladjusted youth who developed into adult "sociopaths." Robins's work served as the basis for the modern psychiatric diagnosis of antisocial personality disorder (ASPD) included in the third through fifth editions of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III, DSM-IV, DSM-5; APA, 1980, 2000, 2013), which emphasize aggression and destructiveness, along with theft, deceitfulness, and rule breaking in childhood, and assaultiveness, lack of remorse, and reckless disregard, along with impulsiveness, irresponsibility, deception, and repeated law-breaking, in adulthood.

These descriptions of psychopathic criminal offenders as cold, vicious, and predatory contrast with Cleckley's (1941/1976) characterization of psychopathic inpatients as affable, emotionally calm, and generally uninclined toward serious acts of violence. However, this alternative perspective has been similarly influential over the years, and some contemporary instruments for assessing psychopathy in youthful and adult clinical samples reflect this predatory criminal concept more than Cleckley's masked pathology concept (Drislane, Patrick, & Arsal, 2014; Sellbom & Phillips, 2013).

### Conceptualizing the "Mask" of Psychopathy

### Key Findings from Contemporary Empirical Research

In thinking about how to conceptualize the mask component of psychopathy described by Cleckley (1941/1976), it is important to consider what we now know about this clinical condition from contemporary research studies using established assessment methods. Two findings in particular that must be considered are that (1) psychopathy is dimensional rather than typological in nature, and (2) psychopathy is multifaceted rather than unitary in terms of its symptomatic features.

#### Psychopathy Is Dimensional

Although personality disorders including ASPD and psychopathy have traditionally been viewed as discrete conditions ("taxons"; Meehl & Golden, 1982) that are either present or absent in assessed individuals, empirical research over the past three decades has roundly challenged this view. As a reflection of this, alternative dimensional systems for personality pathology have existed for some time in the clinical assessment literature (e.g., Clark, 1993; Livesley & Jackson, 2009), and the manual for DSM-5 (American Psychiatric Association, 2013) includes a new dimensional-trait system in Section III, titled "Emerging Measures and Models," as an alternative to the traditional categorical system for personality disorders in the main "Diagnostic Criteria and Codes" section of the manual.

A number of studies have specifically addressed whether psychopathy as assessed by well-established interview- and self-report-based inventories is taxonic or dimensional. The majority of these have provided clear evidence for the dimensionality of psychopathic symptoms, with only a small number of methodologically flawed studies providing evidence for taxonicity (Walters, Marcus, Edens, Knight, & Sanford, 2011). Thus, in contrast with Cleckley's view of psychopathy as a distinct syndrome with a discrete underlying cause, and despite the long-standing practice in research of separating participants into psychopathic and nonpsychopathic groups on the basis of diagnostic cutoff scores, available evidence indicates that psychopathic tendencies vary along a continuum from low to high-with individuals diagnosable as psychopathic differing from others in degree rather than in kind.

#### Psychopathy Is Multifaceted

It is also well established now that psychopathy encompasses separable symptom subdimensions rather than comprising a single, coherent continuum of symptomatology (see Part II of this volume, titled "Distinct Phenotypic Facets of Psychopathy"). The best-established contemporary inventories for assessing psychopathy all contain "factors" or "facets" reflecting psychologically distinct subsets of symptoms. Even measures that were designed to index psychopathy as a unitary syndrome contain distinguishable (albeit correlated) factors. For example, the interview-based Psychopathy Checklist—Revised (PCL-R; Hare, 2003), originally developed to identify offenders in correctional settings who closely matched Cleckley's diagnostic profile (Hare, 1980), contains subsets of items that define interpersonal–affective (Factor 1) and impulsive–antisocial (Factor 2) subdimensions—each divisible into narrower facets (Hare, Neumann, & Mokros, Chapter 3, this volume).

Inventories patterned after the PCL-R, including the informant-rated Antisocial Process Screening Device (APSD; Frick & Hare, 2001) and self-report-based measures, such as Paulhus, Neumann, and Hare's (2015) Self-Report Psychopathy scale (SRP) and the Youth Psychopathic Traits Inventory (YPI; Andershed, Kerr, Stattin, & Levander, 2002), likewise contain correlated factors. Of note, symptom subscales of the self-reportbased Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996; Lilienfeld & Widows, 2005), developed to index psychopathy-related traits represented in differing historic accounts of the disorder, demarcate uncorrelated Fearless Dominance (FD) and Impulsive Antisociality (or Self-Centered Impulsivity; SCI) factors, along with a narrower coldheartedness facet. The implication is that psychopathy subdimensions may be more or less interrelated depending on the conceptual referents and measurement methods used in developing a particular inventory.

Importantly, the symptom subdimensions of psychopathy as assessed by different inventories show contrasting correlates with external criterion measures. In some instances, correlations are selective to one subdimension or another (e.g., PCL-R Factor 2, but not Factor 1, correlates with trait impulsiveness and substance-related problems; Reardon, Lang, & Patrick, 2002); in others, correlations are in opposing directions for one subdimension versus another (e.g., the PPI's FD factor correlates negatively with trait anxiety and internalizing problems, whereas its SCI factor correlates positively with these distress-related criteria; Benning, Patrick, Blonigen, Hicks, & Iacono, 2005). For correlated subdimensions such as those of the PCL-R or SRP, opposing relations with certain criterion measures (including ones related to anxiety, internalizing problems, and suicidal behavior; Hicks & Patrick, 2006; Verona, Patrick, & Joiner, 2001) become stronger when researchers control for the shared variance between the subdimensions. This effect, known as "statistical suppression," is critical to understanding how attributes of different types combine or blend with one another to produce a distinct clinical presentation—and I return to it in the next section.

### Psychopathy as Masked Externalizing Psychopathology: Two Perspectives

In this section, I consider two alternative perspectives on the relationship between the "mask" component of psychopathy and the deviant behavioral tendencies that it operates to conceal. One of these, termed the "unitary-mechanism model," reflects Cleckley's (1941/1976) view that the various diagnostic features of psychopathy emanate from a discrete underlying "disability, disorder, defect, or deviation" (p. 367). The other, termed the "dualdisposition model," posits that the mask features of psychopathy reflect a dispositional tendency separate from that which underlies extreme externalizing tendencies.

Both models rely on a distinction between observable (phenotypic) tendencies of "boldness" and "disinhibition," as described in the triarchic model (Patrick, Fowles, & Krueger, 2009), a conceptual framework put forth to reconcile and integrate different historical descriptions of psychopathy and alternative instruments for assessing it. Boldness relates to the PPI's FD factor and to a structural model of fear/fearlessness measures (Kramer, Patrick, Krueger, & Gasperi, 2012), and encompasses attributes of social assertiveness, emotional stability, and venturesomeness (Lilienfeld, Watts, Smith, & Latzman, Chapter 8, this volume). Disinhibition relates to the PPI's SCI factor and to the concept of general externalizing proneness (Krueger et al., 2002) and involves tendencies toward nonplanfulness, weak restraint, urge-driven behavior, and undependability (Nelson & Foell, Chapter 6, this volume). Conceptualized in this manner, these two dispositional tendencies are largely independent of one another. The triarchic model also recognizes a third dispositional tendency, termed "meanness" in historic conceptions of psychopathy. This construct relates to concepts of callousness-unemotionality (Viding & Kimonis, Chapter 7, this volume) and antagonism (Lynam, Miller, & Derefinko, Chapter 11, this volume) in the child and adult psychopathy literatures, respectively, and to the affectionless, predatory view

of the disorder emphasized in writings on criminal psychopathy.

As I discussed earlier, disinhibitory-externalizing behavior aptly characterizes the overt deviancy component of psychopathy as described by Cleckley (1941/1976), and empirical research confirms a close association between the externalizing psychopathology factor and the impulsive-antisocial subdimension of psychopathy, whether indexed via clinical interview or self-report (e.g., Blonigen et al., 2005, 2010; Patrick, Hicks, Krueger, & Lang, 2005). However, Cleckley's concept of psychopathy includes a distinct absence of the distress and internalizing symptoms that typically accompany externalizing psychopathology, and the triarchic model reconciles this by characterizing Cleckley's sample cases as high in boldness, as well as disinhibition-with boldness reflected in the "mask" features of the disorder, and disinhibition reflected in the overt behavioral deviancy component. Recent research by Crego and Widiger (2016) provides empirical confirmation of boldness as a salient feature of Cleckley's prototype cases. These investigators asked naive participants to rate Cleckley's case examples for various dispositional tendencies, including traits related to boldness, and found that his cases as a whole were perceived as very high in these traits.

Thus, the two models discussed below conceive of Cleckley's (1941/1976) psychopathic patients, in observable symptomatic (i.e., phenotypic) terms, as high-bold/high-disinhibited individuals. However, the models differ in the presumed etiological (genotypic) basis for this configuration of observed tendencies.

#### Unitary Mechanism Model

One perspective on the relationship between the boldness ("mask") and disinhibition (behavioral deviancy) features of psychopathy as described by Cleckley (1941/1976) is that both are observable manifestations of a common underlying pathology. Cleckley's view was that these symptomatic features, along with the shallow-deceptive symptoms, were products of a constitutionally based deficit in emotional responsiveness-"a consistent leveling of [emotional] response to petty ranges and an incapacity to react with sufficient seriousness to achieve much more than pseudoexperience or quasi-experience" (p. 383). He likened the effects of this core deficit to the impact of being born with complete color blindness: Just as color blindness precludes direct experience of variations in chromatic hue and normal appreciation of the aesthetics of such experience, the affective deficit in psychopathy results in an absence of true understanding of the emotional reactions of other people and an interpersonal style based around mimicked reactions and feigned appreciation of others' feelings: "He is . . . lacking in the ability to see that others are moved. . . . It cannot be explained to him because there is nothing in his orbit of awareness that can bridge the gap with comparison. He can repeat the words and say glibly that he understands, and there is no way for him to realize that he does not understand" (p. 40).

Lykken (1957) posited that this deficit involves a specific impairment in the capacity to develop anxiety responses to aversive cues, which he reframed later (Lykken, 1995; Chapter 2, this volume) as a temperament-based weakness in fear reactivity. Like Cleckley (1941/1976), Lykken held the view that all major diagnostic symptoms of psychopathy are traceable to this core deficit in fear response. He suggested that this weakness is necessary for the emergence of true ("primary") psychopathy, but that not all individuals who possess a "low fear temperament" are destined to develop the full clinical condition. He theorized that early socialization influences, in particular parenting style, are critical for determining whether this basic disposition is expressed in prosocial directions (e.g., leadership or heroism) or in antisocial ways (e.g., law breaking or aimless selfindulgence). Writers subsequent to Lykken have proposed dysfunction in particular systems of the brain to account for empirical findings of reduced physiological reactivity to aversive cues of different types in clinically psychopathic individuals (Blair, 2003; Fowles, 1980; Patrick, 1994).

If it is true that all aspects of psychopathy arise from a common core deficit in emotional sensitivity as suggested by Cleckley (1941/1976), or fear reactivity more specifically, as postulated by Lykken, then one might expect that different symptom subdimensions of psychopathy would relate equally to impairments in affective-fear response as indexed by laboratory-task procedures. However, this does not appear to be the case: Lab-assessed deficits in fear and emotional reactivity more broadly are reliably observed in relation to interpersonal-affective (Factor 1) symptoms of psychopathy, but not in relation to impulsive–antisocial (Factor 2) features (for reviews, see, Fowles, Chapter 5, this volume; Patrick, Chapter 18, this volume; Patrick & Bernat, 2009). For example, "aversive startle potentiation"-defined as enhancement of the reflexive blink response to abrupt noise probes presented during viewing of aversive as compared to neutral visual stimuli-is reduced as a function of higher scores on the FD factor of the PPI, but it shows no association with scores on the PPI's orthogonal SCI factor (Benning, Patrick, & Iacono, 2005; Dvorak-Bertsch, Curtin, Rubinstein, & Newman, 2009; see also Vaidyanathan, Patrick, & Bernat, 2009). Parallel results have been reported for the PCL-R's two correlated symptom factors, and in this case contrasting relations (i.e., negative for Factor 1, null for Factor 2) become more evident when researchers control for the shared variance between the two factors (Patrick, 1994; Vaidyanathan et al., 2011). The implication is that reduced affective-fear reactivity plays a role in some symptoms of psychopathy-including those associated with the "mask" component of psychopathy described by Cleckley (1941/1976)but not in others (i.e., the overt behavior deviancy features).

Reciprocal to this, it would be expected from a unitary mechanism perspective that individuals identified as low in emotional responsiveness, or in fearfulness specifically, should generally be more prone to impulsive-antisocial behavior. Cleckley's (1941/1976) notion of a general affective deficit is challenging to quantify in trait-dispositional terms; thus, research to date has focused on the narrower construct of fearfulness, along with the construct of callousness-unemotionality. There is considerable evidence for a contribution of callousness to antisocial behavior (Frick & Marsee, Chapter 19, this volume; Frick, Ray, Thornton, & Kahn, 2014; Viding & Kimonis, Chapter 7, this volume), in line with the forensic concept of psychopathy as a severe, predatory-aggressive criminal type; however, as I discuss more below, callous-unemotional tendencies do not correspond well to the "mask" features emphasized by Cleckley.

As regards fearlessness, the evidence for a direct contribution of this attribute to impulsive–antisocial behavior is mixed. Prominent models of child temperament characterize dispositional fear as independent from the impulsivity-related dimension of inhibitory (or effortful) control, and describe the two traits as differing in their etiological bases, behavioral correlates, and contributions to the development of clinical problems (Kochanska, 1997; Kochanska, Murray, & Coy, 1997; Rothbart, 2007). Counterpart trait dimensions in adults are likewise independent from one another, whether assessed using scale measures alone (Nelson, Strickland, Krueger, Arbisi, & Patrick, 2016) or trait scales combined with neurophysiological measures (Venables et al., 2017). Some evidence exists to indicate that low fearfulness in early childhood affects conscience development (Kochanska, 1997) and predicts the occurrence of later antisocial behavior (e.g., Gao, Raine, Venables, Dawson, & Mednick, 2010; Klingzell et al., 2016). However, measures of fearfulness have varied across such studies and in some cases have overlapped with concurrently assessed psychopathic tendencies, complicating interpretation of relations with later antisocial behavior. Findings from studies with adults have varied depending on how dispositional fear is operationalized. Associations with impulsive-antisocial behavior tend to be positive when fearfulness is assessed in terms of reported reactivity to stressors, negative when fearfulness is defined in terms of sensation-seeking tendencies, and weakly negative or negligible when fearfulness is quantified as (low) boldness (Benning, Patrick, Blonigen, et al., 2005; Blonigen et al., 2005; Drislane et al., 2014; Venables et al., 2014; see also Sylvers, Lilienfeld, & LaPrairie, 2011).

Additional perspective on whether the "mask" features and impulsive-externalizing symptoms of psychopathy arise from a common source comes from a twin study in which Blonigen and colleagues (2005) evaluated causal influences contributing to scores on the FD and SCI factors of the PPI, and tested for etiological overlap between scores on each and interview-assessed symptoms of internalizing and externalizing disorders as defined by DSM criteria. An appreciable contribution of genetic influences was evident for scores on both PPI factors (46 and 51%, respectively) and each showed some degree of genetic overlap with psychopathology symptoms of the two types. PPI SCI scores showed an expectable moderate-level genetic correlation with externalizing disorder symptoms ( $r_g = .49$ ), and a more modest positive genetic association with internalizing disorder symptoms ( $r_g = .20$ ).<sup>2</sup> By contrast, PPI FD scores showed a weak, albeit significant, positive genetic correlation with externalizing symptomatology ( $r_{a}$ = .16), and a moderate-level *negative* genetic association with internalizing symptomatology ( $r_{o}$  = -.40). These results suggest some contribution of genotypic fearlessness to impulse-related problems associated with psychopathy, but relatively minor in comparison with the contribution of heritable disinhibitory tendencies.

To summarize, the possibility that an underlying deficit in emotional reactivity generally, or in fear response specifically, might give rise to both the mask symptoms and behavioral deviance features of psychopathy cannot be ruled out on the basis of existing data. However, what we know so far from empirical research about the relationship between affective deficits and psychopathy argues against this possibility. Weak fear reactivity does appear relevant to the affective-interpersonal features of psychopathy, in particular those reflecting fearless-dominant (bold) tendencies most clearly related to Cleckley's (1941/1976) "mask" concept (Patrick et al., 2009; Patrick & Bernat, 2009; see also Crego & Widiger, 2016), but in itself seems unlikely to account-fully, or even mostly-for the dramatic behavioral deviancy exhibited by his psychopathic patients. An alternative possibility, considered next, is that the masked pathology that Cleckley described reflects the confluence of two distinct but compatible biobehavioral tendencies-one involving diminished sensitivity to aversive events and their consequences, and the other involving reduced capacity for inhibitory control.

#### Dual-Disposition Model

The idea that the unusual masked disinhibitory condition described by Cleckley (1941/1976) is undergirded by a single pathological process is appealing both from a classic medical model perspective and from the standpoint of scientific parsimony. However, the classic medical model has not fared well in general as a framework for understanding psychopathological conditions, which appear complex in neurodevelopmental (Cicchetti & Curtis, 2006; Nigg & Casey, 2005) and neurogenetic terms (Iacono, Vaidyanathan, Vrieze, & Malone, 2016; Need & Goldstein, 2016), and explanatory power needs to be considered along with parsimony in scientific theorizing. For these reasons, it is worthwhile to consider and systematically evaluate the possibility that separate dispositional tendencies with differing causal bases might underlie the seemingly paradoxical constellation of symptoms that Cleckley described. In what follows, I discuss this possibility by posing a set of questions and addressing each with reference to pertinent findings from the empirical literature.

1. What attribute might operate as an effective mask for disinhibitory psychopathology? Problems involving reckless, impulsive, externalizing behavior appear to derive in substantial part from an underlying trait disposition that has been termed "externalizing proneness" or "disinhibitory liability." On average, individuals who exhibit problems of this kind show elevated levels of negative emotionality (neuroticism) and an increased incidence of anxious-depressive psychopathology (Krueger, 1999; Krueger et al., 1996; Vaidyanathan et al., 2011). They tend to be stress reactive, irritable and anger prone, mistrustful of others, pessimistic rather than optimistic, resentful about problems, and abrasive in their interactions with others (Benning, Patrick, Blonigen, et al., 2005; Benning, Patrick, Hicks, Blonigen, & Krueger, 2003, Drislane et al., 2014; Verona et al., 2001). The personality traits associated with externalizing behavior—low constraint (impulsiveness) and negative emotionality-are major trait predictors of suicidality (Joiner, Brown, & Wingate, 2005), and externalizing psychopathology shows a robust positive association with suicidal ideation and action (Venables et al., 2015; Verona, Hicks, & Patrick, 2005; Verona & Patrick, 2002; Verona et al., 2001). These characteristics are directly at odds with Cleckley's (1941/1976) portrayal of psychopathic individuals as personable, socially facile, nonanxious, free from internalizing problems, and disinclined toward suicide.

Is there a coherent dispositional attribute that can co-occur with strong disinhibitory tendencies to block the occurrence of neurotic–internalizing characteristics? To operate in this manner, the attribute in question would have to (1) systematically oppose neurotic–internalizing tendencies, but (2) not attenuate impulsive–externalizing tendencies. In statistical terms, the attribute would be one that selectively *suppresses* neurotic–internalizing characteristics but not impulsive–disinhibitory proclivities.

Statistically, "suppression" refers to a situation in which one variable or attribute operates to attenuate the association of a different attribute with a criterion measure of interest. As an example of this, Paulhus, Robins, Trzeniewski, and Tracy (2004) reported that a Shame scale measure was unrelated to self-reported aggressive behavior at the bivariate (zero-order) level, but showed a significant *positive* association with aggression when included together with a Guilt scale as predictors in a regression model. At the zero-order level, the Guilt scale showed a moderate positive correlation with the shame measure, and a weak negative correlation with aggression-with the latter association becoming more negative when guilt and shame were included together as regression model predictors. The authors' interpretation was that the Shame scale contained variance in common with the Guilt scale, reflecting negative self-consciousness, an attribute not related to aggression, along with variance reflecting hostile–alienated tendencies, related to aggression. In this case, the guilt-related variance within the shame measure operated to suppress its relationship with aggression; when this variance was removed (through regression modeling), a positive association became evident for shame with aggression.<sup>3</sup>

Relating this concept to psychopathy, it can be hypothesized that a coherent dispositional attribute separate from but compatible with impulsive-disinhibitory tendencies, and recognizable as a part of the condition that Cleckley (1941/1976) described, operates as a suppressor of neurotic-internalizing tendencies typically associated with externalizing psychopathology. An attribute that fits this description is the construct of boldness as described in the triarchic model-encompassing tendencies toward social assertiveness, stress immunity, and venturesomeness, and theorized to reflect the expression of an underlying fearless temperament across different functional contexts (Lilienfeld et al., Chapter 8, this volume; Patrick et al., 2009; see also Kramer et al., 2012). As noted earlier, recent work by Crego and Widiger (2016) confirms that boldness is a salient characteristic in Cleckley's case descriptions of psychopathic individuals. Dovetailing with this, traits related to boldness are strongly represented in the expertgenerated, five-factor model (FFM) personality profile considered prototypical of psychopathy (Lynam, Miller, & Derefinko, Chapter 11, this volume; Miller, Lynam, Widiger, & Leukefeld, 2001): In a mixed-gender sample of college students and incarcerated offenders, Ross, Benning, Patrick, Thompson, and Thurston (2009) reported a correlation of .50 between boldness as assessed by the PPI's FD factor and an index of resemblance to the FFM psychopathy prototype computed from scores on the NEO Personality Inventory-Revised (NEO-PI-R); consistent with this, Poy, Segarra, Esteller, López, and Moltó (2014) reported corresponding r's of .62 and .56 in college women and men, respectively, for boldness as assessed by the Triarchic Psychopathy Measure. Other work has shown that the construct of boldness is represented to varying degrees in many contemporary instruments for the assessment of psychopathy, including the PCL-R, the PPI, the SRP, and the YPI (Drislane et al., 2014; Venables, Hall, & Patrick, 2014).

Importantly, boldness as conceptualized in the triarchic model, and as assessed in alternative ways

(cf. Patrick & Drislane, 2015), is uncorrelated with impulsive-disinhibitory tendencies (disinhibition). As a demonstration of this, Drislane and Patrick (2017) modeled the constructs of the triarchic model as latent variables using multiple scale indicators from different assessment inventories, and found a near-zero correlation between latent factors of boldness and disinhibition. From this standpoint, boldness and disinhibition are fully compatible, as the presence of boldness is in no way oppositional to disinhibitory tendencies; thus, the two attributes can readily co-occur. As a corollary of this, positive predictive relations that are evident for boldness in some cases with antisocial behavior (e.g., Blonigen et al., 2005; Hall et al., 2014; Venables et al., 2014) occur independently of, and exert no suppressive effect, on relations for disinhibition.

However, the presence of high boldness does systematically oppose the occurrence of neuroticinternalizing tendencies: Across different scale operationalizations, boldness shows robust negative associations with measures of trait anxiety, fearfulness, neuroticism, and anxious-depressive symptomatology (Benning et al., 2003; Benning, Patrick, Blonigen, et al., 2005; Brislin et al., 2015; Drislane et al., 2014; Sellbom et al., 2016; for a review, see Patrick & Drislane, 2015). As such, the representation of boldness in assessment inventories operates to suppress associations between psychopathy scores and criterion measures of negative emotional traits, internalizing symptomatology, and suicide; that is, psychopathy measures that contain limited representation of boldness show greater positive relations with neurotic-internalizing criteria than those containing stronger representation, and for the latter, relations with neurotic-internalizing outcomes increase when boldness-related variance is removed statistically.

In the case of psychopathy measures such as the PCL-R that include correlated symptom subdimensions, mutual ("cooperative") suppressor effects are commonly observed for differing subdimensions (i.e., the contrast in their relations with neurotic–internalizing variables increases when controlling for covariance between them). For example, associations for PCL-R Factors 1 and 2 with measures of anxiety, depressive symptomatology, and suicidality become more negative and positive, respectively, when overlap between the two factors is removed (Hicks & Patrick, 2006; Verona et al., 2001, 2005). Mutual suppressive effects of this type are especially evident between the PCL-R's Interpersonal and Impulsive facets (Hall, Benning, & Patrick, 2004), which correspond most closely to boldness and disinhibition, respectively (Hall et al., 2014; Venables et al., 2014).

A key question that arises in relation to the hypothesis that Cleckley's concept of psychopathy reflects boldness along with disinhibition is whether individuals with these traits also exhibit shallowdeceptive symptoms (Table 1.1, bottom). From a triarchic model perspective, some of these symptoms-lack of remorse or shame, poverty in affective reactions, inability to love, and lack of social reciprocity-appear most related to the meanness (callous-unemotional) facet of psychopathy. However, meanness in the triarchic model is conceptualized as correlated with boldness and disinhibition, and in their latent-variable representation of the triarchic model, Drislane and Patrick (2017) reported correlations of .30 and .45, respectively, for latent boldness and disinhibition with latent meanness. What aspects of meanness are elevated in high bold/disinhibited individuals? One source of information about this is Krueger, Markon, Patrick, Benning, and Kramer's (2007) Externalizing Spectrum Inventory (ESI), which served as a referent for the triarchic model. The ESI includes scales indexing empathy versus callousness, honesty versus fraudulence, and dependability versus irresponsibility, and these scales cross-load on higher-order factors corresponding to disinhibition and meanness. The implication is that individuals high on disinhibition (along with boldness) are likely to be deficient in empathic concern, deceptive, and socially untrustworthy. Another source of information is Poy and colleagues' (2014) study of FFM correlates of the triarchic model traits. In this study, disinhibition showed moderate negative correlations with four of six facets of FFM Agreeableness (straightforwardness, trust, compliance, altruism), and boldness showed moderate negative associations with two (straightforwardness, modesty). As discussed below, tendencies toward meanness appear even more strongly characteristic of criminally psychopathic individuals, but the foregoing lines of evidence indicate that shallow-deceptive tendencies are likely to be evident in high-bold/high-disinihibited individuals. In addition, because such individuals tend not to be troubled by their behavioral deviancy, they can be expected to have difficulty seeing themselves as others see them (i.e., to be lacking in insight).

In summary, boldness encompasses tendencies related to Cleckley's (1941/1976) "mask" concept and is clearly represented in Cleckley's clinical case descriptions and in various psychopathy inventories including the PCL-R and the PPI. It reflects a dispositional attribute distinct from impulsive-disinhibitory tendencies, so that highdisinhibited individuals can be high in boldness, as well as low or intermediate. Those high in boldness can be expected to present as atypical externalizers, showing strong proclivities toward impulsive-antisocial behavior and substance abuse, but lacking in anxious-depressive tendencies. Direct evidence for this comes from a study by Guarraci, Fishalow, Strickland, Drislane, and Patrick (2013), in which adult participants were recruited from the community based on questionnaire prescreening to represent differing combinations of low versus high boldness and disinhibition-that is, low on both traits, high on one or the other, or high on both—and then tested in a laboratory protocol that included interview-based assessments of DSM disorder symptoms. Participants scoring high in both boldness and disinhibition showed greatly elevated levels of antisocial and substance-related problems relative to those low on both traits, or those high on only one, while also showing the lowest rates of internalizing psychopathology.

2. Is masked disinhibitory psychopathology the "one, true" psychopathy—or are there other variants? As noted at the outset of this major section, the weight of accumulated evidence to date indicates that psychopathy is not a unitary taxonic entity but rather a dimensional construct with multiple facets. In light of this evidence, it has become increasingly clear that continued progress in our understanding of psychopathy demands that we move away from the idea of psychopathy as "one thing"-and from the affiliated notion that there is one "true" (constitutional, or "primary") variant of psychopathy, with other variants to be regarded as "pseudo" (psychogenic, or "secondary"). From this standpoint, the idea that psychopathy as Cleckley (1941/1976) described it reflects the conjunction of high boldness and high disinhibition does not rule out alternative variants involving different configurations of these and other dispositional attributes.

Cleckley's concept of psychopathy was based on psychiatric inpatient cases, and it is plausible that high-bold/disinhibited individuals exhibiting behavior problems of a generally nonviolent nature would be referred often to mental health facilities rather than prisons, at least in Cleckley's time. As noted earlier, an alternative conception of psychopathy, emerging out of research with criminal offenders, placed strong emphasis on predatory aggressive deviancy, often involving coldhearted acts of violence. From a triarchic model standpoint, this predatory criminal variant entails high meanness (callousness–unemotionality) along with high disinhibition. Given that these two dispositions are moderately correlated with one another rather than uncorrelated, but criminogenic in distinctive ways (Frick et al., 2014; Patrick et al., 2009), they are apt to co-occur, and to be associated with especially severe criminal deviancy when they do. However, individuals of this type are expected to appear brash, uncaring, and antagonistic rather than "positive," "agreeable," "alert and friendly," and "easy to talk with," as Cleckley's patients were.

In addition to "masked" and predatory-criminal variants of psychopathy, conceptualized here as high bold/disinhibited and high mean (callous)/ disinhibited variants, another variant described in the historic literature is the so-called "secondary psychopath" (Karpman, 1941, 1948). This term has generally been used for impulsive-antisocial individuals who are notably high in anxious-neurotic tendencies, with the assumption that the behavioral deviancy is an expression of inner conflict engendered by adverse life experiences. However, an alternative view is that individuals of this sort are primarily high in disinhibition, without being high in boldness or in callous-unemotional tendencies distinct to meanness. As discussed in prior sections, disinhibition (general externalizing proneness) is substantially heritable and positively correlated with anxious-neurotic tendencies. As such, high disinhibition in itself appears sufficient to account for what has been called "secondary psychopathy," without the assumption of a unique environmentally based etiology.

It should be noted that because disinhibition and meanness are moderately correlated, violent criminal offenders with elevated scores on both these dimensions can be expected to include a mix of individuals, some who exhibit aggressive tendencies mainly due to anger and weak restraint associated with disinhibition, and others who exhibit aggressive behavior more as a function of emotional insensitivity, low social concern, and predatory goal seeking. Consistent with this, there is a wealth of evidence from the child psychopathy literature indicating that youth with conduct problems who display distinct callous-unemotional traits, compared with those who do not, show a more severe pattern of antisocial behavior involving proactive as well as reactive aggression (Frick et al., 2014; Frick & Marsee, Chapter 19, this volume). This body of evidence served as the impetus
for inclusion of a new specifier in DSM-5 to distinguish variants of conduct disorder with and without callous-unemotional traits. In the adult literature, it has been shown that offenders who score as psychopathic on the PCL-R comprise subgroups with contrasting personality profiles-one marked by very low anxiety and an active (agentic) social style, and the other involving very high hostility/ aggressiveness along with high anxiety and impulsiveness, and low social affiliation (Hicks, Markon, Patrick, Krueger, & Newman, 2004: Hicks & Drislane, Chapter 13, this volume). It seems likely that offenders high in boldness as well as callous-disinhibitory tendencies fall mainly into the first of these subgroups, whereas the latter subgroup likely includes offenders high in disinhibition and meanness but not boldness, along with some primarily high in disinhibition.

The major point I wish to convey is that, from the modern perspective of psychopathy as dimensional and multifaceted, different configurations of psychopathy-related tendencies can occur that are clinically interesting. Two distinct configurations, one involving high boldness combined with high disinhibition, and the other high meanness coupled with high disinhibition, appear characteristic (respectively) of psychopathic hospital patients as described by Cleckley (1941/1976) and psychopathic criminal offenders, as described by McCord and McCord (1964). Since the time of Cleckley and his contemporary Karpman, high disinhibition in itself, even when expressed in terms of aggressive criminal behavior, has not been regarded as "truly psychopathic." This is understandable from the standpoint of differential diagnosis because high disinhibition is associated with multiple overlapping conditions including attention-deficit/hyperactivity disorder, substancerelated problems, other addictions (e.g., gambling, sex), and borderline personality disorder. Requiring the presence of features related to boldness and/or meanness helps to distinguish psychopathy from these other disinhibitory conditions.<sup>4</sup>

An important priority in future research will be to systematically investigate the clinical presentation and biobehavioral correlates of differing configurations of psychopathy facets as specified in the triarchic model. In addition to comparing high-bold/disinhibited, high-mean/disinhibited, and high-disinhibited-only individuals, participants representing other configurations of triarchic traits will be interesting to recruit and study. For example, low-disinhibited individuals who score high on boldness, or on boldness and meanness together, may constitute alternative variants of so-called "successful" psychopathy (Benning, Venables, & Hall, Chapter 24, this volume). Individuals low in disinhibition and boldness but high in meanness will also be interesting to investigate, particularly in light of preliminary work suggesting that meanness in itself may dispose to circumscribed behavioral deviance of certain types (Hickey, Walters, Drislane, Palumbo, & Patrick, Chapter 23, this volume).

3. What causal (genotypic) mechanisms underlie distinctive symptom facets and clinical manifestations of psychopathy? The triarchic model focuses on symptomatic features of psychopathy represented in different historical conceptions and alternative measurement instruments-identifying boldness, meanness, and disinhibition as major thematic elements in differing accounts of this clinical condition. As such, the triarchic model is descriptive in nature: It organizes manifest-observed symptoms of psychopathy around hypothesized trait dimensions that connect up with constructs in other literatures-including the developmental literature on temperament, findings pertaining to normal and abnormal personality, and child and adult studies of general psychopathology (Patrick & Drislane, 2015). As a trait-oriented model with links to the personality literature, the triarchic model is compatible with descriptive schemes for psychopathy based around the FFM (Lynam et al., Chapter 11, this volume) and other general models of personality (e.g., Benning, Partrick, Blonigen, et al., 2005; Brislin, Drislane, Smith, Edens, & Patrick, 2015). This is illustrated, for example, by (1) research by Poy and colleagues (2014) showing that scores on the three constructs of the triarchic model (assessed using the Triarchic Psychopathy Measure [TriPM]) predicted scores on the FFM-based psychopathy prototype (quantified using the NEO-PI-R) at levels exceeding R = .7 in both male and female participants, and (2) work by Drislane, Jones, Brislin, and Patrick (2017) showing that effective scale measures of the triarchic model constructs could be constructed using items from the NEO-PI-R.

However, a major difference between the triarchic model and other descriptive systems for psychopathy is that it characterizes psychopathic symptomatology in terms of dispositional constructs that are explicitly *biobehavioral*—that is, trait constructs that relate clearly to the literature on biological systems for behavior, as well as to literatures on temperament/personality and general psychopathology. Boldness, as conceptualized in the triarchic model, connects to the biobehavioral concept of acute threat reactivity, meanness connects to the concept of affiliation/attachment, and disinhibition to the concept of inhibitory control—concepts that relate in turn to distinct neurobiological systems (Kozak & Cuthbert, 2016). By reconceptualizing psychopathy in these terms, the triarchic model provides a framework for investigating how symptomatic features of psychopathy relate to variations in the functioning of core neurobiological systems.

Two key points regarding this biobehavioral trait approach warrant mention. First, the psychological concepts of boldness, meanness, and disinhibition are not assumed to correspond directly to neurobiological systems for threat reactivity, affiliative capacity, and inhibitory control. Instead, it is only assumed that certain physiological and behavioral indicators of these systems will relate preferentially to one or another of these constructs—for example, aversive startle potentiation to boldness (Vaidyanathan et al., 2009), recognition and processing of facial distress cues to meanness (Brislin et al., 2017; Marsh et al., 2008), and reduced cognitive brain response to disinhibition (Nelson, Patrick, & Bernat, 2011). Operating from this premise, the triarchic model provides a starting point for establishing cross-domain operationalizations of constructs corresponding to threat reactivity, affiliation, and inhibitory control, that is, assessments of these constructs that incorporate neurophysiological and behavioral indicators along with psychological scale indicators (Patrick et al., 2013; Yancey, Venables, & Patrick, 2016) as a basis for understanding psychopathy in biobehavioral terms.

The other major point regarding this biobehavioral trait approach is that it recognizes the importance of development to an etiological analysis of psychopathy and other clinical conditions. More specifically, it views psychopathological symptoms as expressions of core biobehavioral tendencies shaped by developmental processes and life experiences across time (Patrick & Hajcak, 2016), and manifested in psychologically salient, trait-relevant contexts (Eysenck, 1967; Tellegen, 1991). That is, to understand the etiology of psychopathy, it will be necessary to clarify how variations among people in the functioning of basic biobehavioral systems relate across phases of development to distinct psychological tendencies that relate in turn to observable symptoms of psychopathy (Buchman-Schmitt, Brislin, Venables, Joiner, & Patrick, 2017; Patrick & Hajcak, 2016). This point is discussed further in "Cognitive and Emotional Processing" (Patrick, Chapter 18, this volume).

As a final point, given evidence indicating highly polygenic patterns of inheritance for clinical disorders, psychological traits, and neurophysiological indicators (Iacono et al., 2016; Need & Goldstein, 2016), it seems likely that the interface between variations in the functioning of basic biobehavioral systems and proclivities toward problems of particular types will prove to be complex. For example, genes for weak threat sensitivity might combine in one case with genes for weak affiliation to produce maladaptive callous-unemotional tendencies, and in another case with experiences promoting strong affect regulation to produce adaptive bold tendencies (cf. Fowles, Chapter 5, this volume). A detailed multilevel and developmentally informed analysis will be required to achieve understanding of pathways to alternative variants of psychopathy marked by distinct configurations of observable symptoms.

#### Conclusion

Cleckley (1941/1976) characterized psychopathy as a paradoxical condition involving severe behavioral deviancy masked by an outward appearance of robust mental health. Although Cleckley posited a unitary causal mechanism underlying this constellation of symptoms, an alternative possibility-supported by various lines of evidence-is that the masked pathology he described reflects the co-occurrence of two separate dispositional tendencies: boldness and disinhibition. A third dispositional tendency, callousness-unemotionality or meanness, is postulated to play a greater role in criminal expressions of psychopathy involving predatory exploitativeness and violence. The triarchic model of psychopathy conceives of these three dispositional tendencies as related to variations in the functioning of different biobehavioral systems. As such, the model provides an integrative framework for characterizing alternative variants of psychopathy and clarifying causal mechanisms that give rise to them.

#### ACKNOWLEDGMENTS

Preparation of this chapter was supported by grant W911NF-14-1-0018 from the U.S. Army. The content of this chapter is solely the responsibility of the author and does not necessarily represent the official views of the U.S. Government, Department of Defense, Department of the Army, Department of Veterans Affairs, or U.S. Recruiting Command.

#### NOTES

- Examples of public figures who displayed severe externalizing problems along with salient anxious– depressive tendencies include late musicians Amy Winehouse and Simon John Ritchie (better known as "Sid Vicious").
- The genetic correlation (rg) reflects the magnitude of relationship between the variance in one measure that is attributable to genetic influences and the corresponding genetic variance in another measure.
- Variance partitioning techniques, such as multiple regression and partial correlational analysis, are considered essential for detecting and clarifying suppressor effects (Tzelgov & Henik, 1991; Watson, Clark, Chmielweski, & Kotov, 2013).
- 4. The new trait-dimensional system for personality pathology in Section III of DSM-5 characterizes ASPD in terms of traits from domains of Disinhibition and Antagonism (corresponding to meanness), and includes a psychopathy specifier for designating a highbold variant of ASPD.

#### REFERENCES

- Achenbach, T. M. (1966). The classification of children's psychiatric symptoms: A factor-analytic study. *Psychological Monographs: General and Applied*, 80, 1–37.
- Achenbach, T. M., & Edelbrock, C. S. (1978). The classification of child psychopathology: A review and analysis of empirical efforts. *Psychological Bulletin*, 85, 1275–1301.
- American Psychiatric Association. (1980). Diagnostic and statistical manual of mental disorders (3rd ed.). Washington, DC: Author.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: Author.
- Andershed, H., Kerr, M., Stattin, H., & Levander, S. (2002). Psychopathic traits in non-referred youths: A new assessment tool. In E. Blaauw & L. Sheridan (Eds.), Psychopaths: Current international perspectives (pp. 131–158). The Hague: Elsevier.
- Benning, S. D., Patrick, C. J., Blonigen, D. M., Hicks, B. M., & Iacono, W. G. (2005). Estimating facets of psychopathy from normal personality traits: A step toward community-epidemiological investigations. Assessment, 12, 3–18.

- Benning, S. D., Patrick, C. J., Hicks, B. M., Blonigen, D. M., & Krueger, R. F. (2003). Factor structure of the Psychopathic Personality Inventory: Validity and implications for clinical assessment. *Psychological As*sessment, 15, 340–350.
- Benning, S. D., Patrick, C. J., & Iacono, W. G. (2005). Fearlessness and underarousal in psychopathy: Startle blink modulation and electrodermal reactivity in a young adult male community sample. *Psychophysiol*ogy, 42, 753–762.
- Blair, R. J. R. (2003). Neurobiological basis of psychopathy. British Journal of Psychiatry, 182, 5–7.
- Blonigen, D. M., Hicks, B. M., Patrick, C. J., Krueger, R. F., Iacono, W. G., & McGue, M. K. (2005). Psychopathic personality traits: Heritability and genetic overlap with internalizing and externalizing psychopathology. *Psychological Medicine*, 35, 1–12.
- Blonigen, D. M., Patrick, C. J., Douglas, K. S., Poythress, N. G., Skeem, J. L., Lilienfeld, S. O., et al. (2010). Multimethod assessment of psychopathy in relation to factors of internalizing and externalizing from the Personality Assessment Inventory: The impact of method variance and suppressor effects. *Psychological Assessment*, 22, 96–107.
- Brislin, S. J., Drislane, L. E., Smith, S. T., Edens, J. F., & Patrick, C. J. (2015). Development and validation of triarchic psychopathy scales from the Multidimensional Personality Questionnaire. *Psychological As*sessment, 27, 838–851.
- Brislin, S. J., Yancey, J. R., Perkins, E. R., Palumbo, I. M., Drislane, L. E., Salekin, R. T., et al. (2017). Callousness and affective face processing in adults: Behavioral and brain-potential indicators. *Personality Disorders: Theory, Research, and Treatment.* [Epub ahead of print]
- Buchman-Schmitt, J. M., Brislin, S. J., Venables, N. C., Joiner, T. J., & Patrick, C. J. (2017). Trait liabilities and specific promotive processes in psychopathology: The example of suicide. *Journal of Affective Disorders*, 216, 100–108.
- Cicchetti, D., & Curtis, W. J. (2006). The developing brain and neural plasticity: Implications for normality, psychopathology, and resilience. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology: Developmental neuroscience* (2nd ed., Vol. 2, pp. 1–64). New York: Wiley.
- Clark, L. A. (1993). Manual for the Schedule for Nonadaptive and Adaptive Personality. Minneapolis: University of Minnesota Press.
- Cleckley, H. (1976). The mask of sanity (5th ed.). St. Louis, MO: Mosby. (Original work published 1941)
- Crego, C., & Widiger, T. A. (2016). Cleckley's psychopaths: Revisited. Journal of Abnormal Psychology, 125, 75–87.
- Drislane, L. E., Jones, S., Brislin, S. J., & Patrick, C. J. (2017). Interfacing five-factor model and triarchic conceptualizations of psychopathy. *Psychological Assessment*. [Epub ahead of print]
- Drislane, L. E., & Patrick, C. J. (2017). Integrating al-

ternative conceptions of psychopathic personality: A latent variable model of triarchic psychopathy constructs. *Journal of Personality Disorders*, 31, 110–132.

- Drislane, L. E., Patrick, C. J., & Arsal, G. (2014). Clarifying the content coverage of differing psychopathy inventories through reference to the Triarchic Psychopathy Measure. *Psychological Assessment*, 26, 350–362.
- Dvorak-Bertsch, J. D., Curtin, J., Rubinstein, T., & Newman, J. P. (2009). Psychopathic traits moderate the interaction between cognitive and affective processing. Psychophysiology, 46, 913–921.
- Eysenck, H. J. (1967). The biological basis of personality. Springfield, IL: Charles C Thomas.
- Fowles, D. C. (1980). The three arousal model: Implications of Gray's two-factor learning theory for heart rate, electrodermal activity, and psychopathy. *Psychophysiology*, 17, 87–104.
- Freud, S. (1961). The ego and the id. In J. Strachey (Ed. & Trans.), The standard edition of the complete psychological works of Sigmund Freud (Vol. 19, pp. 3–66). London: Hogarth Press. (Original work published 1923)
- Frick, P. J., & Hare, R. D. (2001). The Antisocial Process Screening Device (APSD). Toronto: Multi-Health Systems.
- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014). Can callous–unemotional traits enhance the understanding, diagnosis, and treatment of serious conduct problems in children and adolescents?: A comprehensive review. *Psychological Bulletin*, 140, 1–57.
- Gao, Y., Raine, A., Venables, P. H., Dawson, M. E., & Mednick, S. A. (2010). Association of poor childhood fear conditioning and adult crime. *American Journal of Psychiatry*, 157, 56–60.
- Gorenstein, E. E., & Newman, J. P. (1980). Disinhibitory psychopathology: A new perspective and a model for research. *Psychological Review*, 87, 301–315.
- Guarraci, S. M., Fishalow, J. L., Strickland, C. M., Drislane, L. E., & Patrick, C. J. (2013, June). Validation of a recruitment strategy using transdiagnostic dimensions. Paper presented at the 5th annual meeting of the Society for the Scientific Study of Psychopathy, Washington, DC.
- Hall, J., Benning, S. D., & Patrick, C. J. (2004). Criterion-related validity of the three-factor model of psychopathy: Personality, behavior, and adaptive functioning. Assessment, 11, 4–16.
- Hall, J. R., Drislane, L. E., Murano, M., Patrick, C. J., Lilienfeld, S. O., & Poythress, N. G. (2014). Development and validation of triarchic construct scales from the Psychopathic Personality Inventory. *Psychological Assessment*, 26, 447–461.
- Hare, R. D. (1965a). Acquisition and generalization of a conditioned fear response in psychopathic and nonpsychopathic criminals. *Journal of Psychology*, 59, 367–370.
- Hare, R. D. (1965b). Temporal gradient of fear arousal

in psychopaths. Journal of Abnormal Psychology, 70, 442–445.

- Hare, R. D. (1978). Electrodermal and cardiovascular correlates of psychopathy. In R. D. Hare & D. Schalling (Eds.), *Psychopathic behavior: Approaches to research* (pp. 107–143). Chichester, UK: Wiley.
- Hare, R. D. (1980). A research scale for the assessment of psychopathy in criminal populations. *Personality* and Individual Differences, 1, 111–119.
- Hare, R. D. (1993). Without conscience. New York: Guilford Press.
- Hare, R. D. (2003). The Hare Psychopathy Checklist— Revised (2nd ed.). Toronto: Multi-Health Systems.
- Hicks, B. M., Markon, K., Patrick, C. J., Krueger, R. F., & Newman, J. P. (2004). Identifying psychopathy subtypes on the basis of personality structure. *Psychological Assessments*, 16, 276–288.
- Hicks, B. M., & Patrick, C. J. (2006). Psychopathy and negative affectivity: Analyses of suppressor effects reveal distinct relations with trait anxiety, depression, fearfulness, and anger–hostility. *Journal of Abnormal Psychology*, 115, 276–287.
- Iacono, W. G., Vaidyanathan, U., Vrieze, S. I., & Malone, S. M. (2016). Knowns and unknowns for psychophysiological endophenotypes: Integration and response to commentaries. *Psychophysiology*, *51*, 1339–1347.
- Joiner, T. E., Brown, J. S., & Wingate, L. R. (2005). The psychology and neurobiology of suicidal behavior. *Annual Review of Psychology*, 56, 287–314.
- Jung, C. G. (1963). Memories, dreams, reflections (A. Jaffe, Ed., & C. Winston, Trans.). New York: Crown/ Random House.
- Karpman, B. (1941). On the need for separating psychopathy into two distinct clinical types: Symptomatic and idiopathic. *Journal of Criminology and Psychopathology*, 3, 112–137.
- Karpman, B. (1948). Conscience in the psychopath: Another version. American Journal of Orthopsychiatry, 18, 455–491.
- Klingzell, I., Fanti, K. A., Colins, O. F., Frogner, L., Andershed, A. K., & Andershed, H. (2016). Early childhood trajectories of conduct problems and callous–unemotional traits: The role of fearlessness and psychopathic personality dimensions. *Child Psychiatry and Human Development*, 47, 236–247.
- Koch, J. L. (1891). Die psychopathischen Minderwertigkeiten [Psychopathic inferiorities]. Ravensburg, Germany: Maier.
- Kochanska, G. (1997). Multiple pathways to conscience for children with different temperaments: From toddlerhood to age five. *Developmental Psychology*, 33, 228–240.
- Kochanska, G., Murray, K., & Coy, K. C. (1997). Inhibitory control as a contributor to conscience in childhood: From toddler to early school age. *Child Devel*opment, 68, 263–277.
- Kozak, M. J., & Cuthbert, B. N. (2016). The NIMH Research Domain Criteria Initiative: Background, issues, and pragmatics. Psychophysiology, 53, 286–297.

- Kraepelin, E. (1915). Psychiatrie: Ein lehrbuch (8th ed.) [Psychiatry: A textbook]. Leipzig: Barth. (Original work published 1904)
- Kramer, M. D., Patrick, C. J., Krueger, R. F., & Gasperi, M. (2012). Delineating physiological defensive reactivity in the domain of self-report: Phenotypic and etiologic structure of dispositional fear. *Psychological Medicine*, 42, 1305–1320.
- Krueger, R. F. (1999). The structure of common mental disorders. Archives of General Psychiatry, 56, 921–926.
- Krueger, R. F., Caspi, A., Moffitt, T. E., & Silva, P. A. (1998). The structure and stability of common mental disorders (DSM-III-R): A longitudinal–epidemiological study. *Journal of Abnormal Psychology*, 107, 216–227.
- Krueger, R. F., Caspi, A., Moffitt, T. E., Silva, P. A., & McGee, R. (1996). Personality traits are differentially linked to mental disorders: A multitrait-multidiagnosis study of an adolescent birth cohort. *Journal of Abnormal Psychology*, 105, 299–312.
- Krueger, R. F., Hicks, B., Patrick, C. J., Carlson, S., Iacono, W. G., & McGue, M. (2002). Etiologic connections among substance dependence, antisocial behavior, and personality: Modeling the externalizing spectrum. *Journal of Abnormal Psychology*, 111, 411–424.
- Krueger, R. F., Markon, K. E., Patrick, C. J., Benning, S. D., & Kramer, M. (2007). Linking antisocial behavior, substance use, and personality: An integrative quantitative model of the adult externalizing spectrum. *Journal of Abnormal Psychology*, 116, 645–666.
- Krueger, R. F., McGue, M., & Iacono, W. G. (2001). The high-order structure of common mental disorders: Internalization, externalization, and their connections to personality. *Personality and Individual Differences*, 30, 1245–1259.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment*, 66, 488–524.
- Lilienfeld, S. O., & Widows, M. R. (2005). Psychopathic Personality Inventory—Revised (PPI-R) professional manual. Odessa, FL: Psychological Assessment Resources.
- Lindner, R. M. (1944). Rebel without a cause: The story of a criminal psychopath. New York: Grune & Stratton.
- Livesley, W. J., & Jackson, D. N. (2009). Manual for the Dimensional Assessment of Personality Pathology— Basic Questionnaire. Port Huron, MI: Sigma Press.
- Lykken, D. T. (1957). A study of anxiety in the sociopathic personality. Journal of Abnormal and Clinical Psychology, 55, 6–10.
- Lykken, D. T. (1995). The antisocial personalities. Hillsdale, NJ: Erlbaum.
- Marsh, A. A., Finger, E. C., Mitchell, D. G., Reid, M. E., Sims, C., Kosson, D. S., et al. (2008). Reduced amygdala response to fearful expressions in children

and adolescents with callous–unemotional traits and disruptive behavior disorders. American Journal of Psychiatry, 165, 712–720.

- McCord, W., & McCord, J. (1964). The psychopath: An essay on the criminal mind. Princeton, NJ: Van Nostrand.
- Meehl, P. E., & Golden, R. (1982). Taxometric methods. In P. Kendall & J. Butcher (Eds.), Handbook of research methods in clinical psychology (pp. 127–181). New York: Wiley.
- Miller, J. D., Lynam, D. R., Widiger, T. A., & Leukefeld, C. (2001). Personality disorders as extreme variants of common personality dimensions: Can the five-factor model adequately represent psychopathy? *Journal* of *Personality*, 69, 253–276.
- Need, A. C., & Goldstein, D. B. (2016). Neuropsychiatric genomics in precision medicine: Diagnostics, gene discovery, and translation. *Dialogues in Clinical Neuroscience*, 18, 237–252.
- Nelson, L. D., Patrick, C. J., & Bernat, E. M. (2011). Operationalizing proneness to externalizing psychopathology as a multivariate psychophysiological phenotype. *Psychophysiology*, 48, 64–72.
- Nelson, L. D., Strickland, C. M., Krueger, R. F., Arbisi, P. A., & Patrick, C. J. (2016). Neurobehavioral traits as transdiagnostic predictors of clinical problems. *Assessment*, 23, 75–85.
- Nigg, J. T., & Casey, B. J. (2005). An integrative theory of attention-deficit hyperactivity disorder based on the cognitive and affective neurosciences. *Development and Psychopathology*, 17, 785–806.
- Patrick, C. J. (1994). Emotion and psychopathy: Startling new insights. Psychophysiology, 31, 319–330.
- Patrick, C. J. (2006). Back to the future: Cleckley as a guide to the next generation of psychopathy research. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 605–617). New York: Guilford Press.
- Patrick, C. J., & Bernat, E. M. (2009). Neurobiology of psychopathy: A two-process theory. In G. G. Berntson & J. T. Cacioppo (Eds.), Handbook of neuroscience for the behavioral sciences (pp. 1110–1131). New York: Wiley.
- Patrick, C. J., & Drislane, L. E. (2015). Triarchic model of psychopathy: Origins, operationalizations, and observed linkages with personality and general psychopathology. *Journal of Personality*, 83, 627–643.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, 21, 913–938.
- Patrick, C. J., & Hajcak, G. (2016). RDoC: Translating promise into progress. Psychophysiology, 53, 415–424.
- Patrick, C. J., Hicks, B. M., Krueger, R. F., & Lang, A. R. (2005). Relations between psychopathy facets and externalizing in a criminal offender sample. *Journal* of Personality Disorders, 19, 339–356.
- Patrick, C. J., Venables, N. C., Yancey, J. R., Hicks, B. M., Nelson, L. D., & Kramer, M. D. (2013). A construct-network approach to bridging diagnostic and

physiological domains: Application to assessment of externalizing psychopathology. *Journal of Abnormal Psychology*, *122*, 902–916.

- Paulhus, D. L., Neumann, C. S., & Hare, R. D. (2015). Manual for the Self-Report Psychopathy Scale (4th ed.). Toronto: Multi-Health Systems.
- Paulhus, D. L., Robins, R. W., Trzesniewski, K. H., & Tracy, J. L. (2004). Two replicable suppressor situations in personality research. *Multivariate Behavioral Research*, 39, 303–328.
- Pinel, P. (1962). A treatise on insanity (D. Davis, Trans.). New York: Hafner. (Original work published 1806)
- Poy, R., Segarra, P., Esteller, A., López, R., & Moltó, J. (2014). FFM description of the triarchic conceptualization of psychopathy in men and women. *Psychological Assessment*, 26, 69–76.
- Pritchard, J. C. (1835). A treatise on insanity and other disorders affecting the mind. London: Sherwood, Gilbert & Piper.
- Reardon, M. L., Lang, A. R., & Patrick, C. J. (2002). Antisociality and alcohol problems: An evaluation of subtypes, drinking motives, and family history in incarcerated men. Alcoholism: Clinical and Experimental Research, 26, 1188–1197.
- Robins, L. N. (1966). Deviant children grown up. Baltimore: Williams & Wilkins.
- Robins, L. N. (1978). Sturdy predictors of adult antisocial behaviour: Replications from longitudinal studies. Psychological Medicine, 8, 611–622.
- Ross, S. R., Benning, S. D., Patrick, C. J., Thompson, A., & Thurston, A. (2009). Factors of the Psychopathic Personality Inventory: Criterion-related validity and relationship to the BIS/BAS and Five-Factor models of personality. Assessment, 16, 71–87.
- Rothbart, M. K. (2007). Temperament, development and personality. Current Directions in Psychological Science, 16, 207–212.
- Schneider, K. (1934). Die psychopathischen persönlichkeiten (3rd ed.) [Psychopathic personalities]. Vienna: Deuticke.
- Sellbom, M., Drislane, L. E., Johnson, A. K., Goodwin, B. E., Philips, T. R., & Patrick, C. J. (2016). Development and validation of MMPI-2-RF scales for indexing triarchic psychopathy constructs. Assessment, 23, 527–543.
- Sellbom, M., & Phillips, T. R. (2013). An examination of the triarchic conceptualization of psychopathy in incarcerated and non-incarcerated samples. *Journal* of Abnormal Psychology, 122, 208–214.
- Sher, K. J., & Trull, T. (1994). Personality and disinhibitory psychopathology: Alcoholism and antisocial personality disorder. *Journal of Abnormal Psychology*, 103, 92–102.
- Sylvers, P., Lilienfeld, S. O., & LaPrairie, J. L. (2011). Differences between trait fear and trait anxiety: Implications for psychopathology. *Clinical Psychology Review*, 31, 122–137.
- Tellegen, A. (1991). Personality traits: Issues of definition, evidence, and assessment. In D. Cicchetti & W.

Grove (Eds.), Thinking clearly about psychology: Essays in honor of Paul Everett Meehl (pp. 10–35). Minneapolis: University of Minnesota Press.

- Tzelgov, J., & Henik, A. (1991). Suppression situations in psychological research: Definitions, implications, and applications. *Psychological Bulletin*, 109, 524–536.
- Vaidyanathan, U., Patrick, C. J., & Bernat, E. M. (2009). Startle reflex potentiation during aversive picture viewing as an index of trait fear. *Psychophysiology*, 46, 75–85.
- Vaidyanathan, U., Patrick, C. J., & Iacono, W. G. (2011). Patterns of comordibity among common mental disorders: A person-centered approach. Comprehensive Psychiatry, 52, 527–535.
- Venables, N. C., Hall, J. R., & Patrick, C. J. (2014). Differentiating psychopathy from antisocial personality disorder: A triarchic model perspective. *Psychological Medicine*, 44, 1005–1013.
- Venables, N. C., Hicks, B. M., Yancey, J. R., Kramer, M. D., Nelson, L. D., Strickland, C. S., et al. (2017). Evidence of a prominent genetic basis for relations between psychoneurometric traits and common mental disorders. *International Journal of Psychophysiology*, 115, 4–12.
- Venables, N. C., Sellbom, M., Sourander, A., Kendler, K. S., Joiner, T. E., Drislane, L. E., et al. (2015). Separate and interactive contributions of weak inhibitory control and threat sensitivity to prediction of suicide risk. *Psychiatry Research*, 226, 461–466.
- Verona, E., Hicks, B. M., & Patrick, C. J. (2005). Psychopathy and suicidal behavior in female offenders: Mediating influences of temperament and abuse history. *Journal of Consulting and Clinical Psychology*, 73, 1065–1073.
- Verona, E., & Patrick, C. J. (2000). Suicide risk in externalizing syndromes: Temperamental and neurobiological underpinnings. In T. E. Joiner (Ed.), Suicide science: Expanding the boundaries (pp. 137–173). Boston: Kluwer Academic.
- Verona, E., Patrick, C. J., & Joiner, T. T. (2001). Psychopathy, antisocial personality, and suicide risk. *Journal of Abnormal Psychology*, 110, 462–470.
- Verona, E., Sachs-Ericsson, N., & Joiner, T. E. (2004). Suicide attempts associated with externalizing psychopathology in an epidemiological sample. *Ameri*can Journal of Psychiatry, 161, 444–451.
- Walters, G. D., Marcus, D. K., Edens, J. F., Knight, R. A., & Sanford, G. (2011). In search of the psychopathic sexuality taxon: Indicator size does matter. *Behavioral Sciences and the Law*, 29, 23–39.
- Watson, D., Clark, L. A., Chmielweski, M., & Kotov, R. (2013). The value of suppressor effects in explicating the construct validity of symptom measures. *Psychological Assessment*, 25, 929–941.
- Yancey, J. R., Venables, N. C., & Patrick, C. J. (2016). Psychoneurometric operationalization of threat sensitivity: Relations with clinical symptom and physiological response criteria. *Psychophysiology*, 53, 393–405.

# CHAPTER 2

# Psychopathy, Sociopathy, and Antisocial Personality Disorder

DAVID T. LYKKEN

'he term "psychopathic personality," so awkward etymologically in its current usage, was an appropriate choice when first introduced in the late 1800s, for then it embraced a broad group of behavioral pathologies suggestive of psychopathology but unclassifiable in any of the categories of mental disorder then current. In 1930, Partridge reviewed that literature and identified a subgroup for whom difficulty (or refusal) to adapt to the demands of society is the pathognomonic symptom, and he named this disorder "sociopathic personality." For the next 50 years or so, dangerous or persistent lawbreakers were labeled variously as psychopaths or sociopaths, with negligible diagnostic consistency or clarity. Psychiatric diagnosis was an impressionistic art form, and even experienced practitioners often could not agree in classifying the same patients except in a very general way (e.g., "psychotic"). Diagnoses sometimes were based on highly subjective inferences about the patient's unconscious impulses and motivations or on the clinician's unsystematic and even quirky observations accumulated over years of practice.

The American Psychiatric Association (APA) published its first Diagnostic and Statistical Manual of Mental Disorders (DSM) in 1952 but it was not until the third edition, DSM-III, appeared in 1980 that some measure of diagnostic consistency was finally achieved. This was accomplished in DSM-III and in DSM-IV, published in 1994, by formulating diagnostic criteria that were relatively objective and noninferential. For the most part, the criteria were arrived at by consensus of committees of clinicians rather than by statistical analysis of empirical data. To be diagnosed with antisocial personality disorder (ASPD) according to the criteria of DSM-IV (and now DSM-5 [APA, 2013]; see Widiger & Crego, Chapter 12, this volume), an individual must (1) currently be 18 years or older; (2) display features of conduct disorder prior to the age of 15; and (3) have exhibited an antisocial pattern since age 15 involving symptoms such as repeated unlawful acts, impulsiveness, irresponsibility, deceptiveness, aggression, and lack of remorse, not attributable to (4) major mental illness in the form of schizophrenia or bipolar (manic-depressive) disorder.

No special psychiatric knowledge or insight is required to make a diagnosis on the basis of these guidelines, a fact that no doubt accounts for the good reliability or interrater agreement achieved

*Editor's Note.* Dr. Lykken passed away in 2006, the year the first edition of this handbook was published. This chapter duplicates, with revised title and minor nonsubstantive edits, the version that appeared in the initial edition.

by DSM-IV. The cookbook-like, relatively objective character of the diagnostic criteria for ASPD is obvious; what is not so apparent is the fact that there is no theoretical or empirical basis for supposing that this scheme carves Nature at her joints. Because there may be a variety of psychological causes for a given action, classifying people by their actions rather than their psychological dispositions or traits, although natural for the purposes of criminal law, is less useful for the purposes of psychiatry or science.

Note that the cutoff age of 18 years for the ASPD diagnosis makes more sense in legal than in psychiatric terms. In most of the United States, 18 is the age of legal responsibility, although, of course, it is absurd to suppose that delinquent youth undergo some psychological transformation on their 18th birthdays. In view of the alarming contemporary increase in the number of homicides and other major crimes by youngsters under age 18, with many of them now being tried as adults and incarcerated for long periods, it is noteworthy that none of them could be classified as having ASPD.

As one might expect from reviewing the diagnostic criteria for ASPD, however, a large proportion of those heterogeneous individuals whom we call common criminals could be diagnosed with this condition, along with many feckless citizens who do not commit serious crimes. Consider, for example, persons exhibiting antisocial deviance since age 15 in the form of repeated unlawful acts, deceptiveness, aggression, and lack of remorse; these might be the garden-variety criminals who populate most jails and prisons. Other persons who instead exhibit impulsiveness, irresponsibility, and negligent risk-taking might also be diagnosed with ASPD, although they are not criminals but, rather, are drifters or addicts or drunks. ASPD is plainly a heterogeneous category with respect to both etiology and the psychological characteristics that give rise to the varied patterns of socially deviant behavior that serve to meet the criteria. Identifying someone as "having" ASPD is about as nonspecific and scientifically unhelpful as diagnosing a sick patient as having a fever, or an infectious or neurological disorder.

In spite of the heterogeneity of the group classified by DSM-IV/5 criteria, ASPD does at least demarcate a category of individuals that is socially important because many of these people are the reasons why we lock our doors, stay off the streets at night, move out of the cities, and send our children to private schools. A majority of inmates in our prisons meet these criteria for the diagnosis of ASPD,<sup>1</sup> so it is not unreasonable to conclude that they identify more than half of the men whom we normally refer to as common criminals. But these antisocial personalities are clearly diverse, not only in symptoms but also in etiology. I have proposed (Lykken, 1995) a diagnostic scheme in which ASPD is treated as a family of disorders, comprising two main genera, the psychopaths and the sociopaths, each of which contains several species that differ from each other in their underlying causes.

Species that I classify as psychopaths fail to become socialized primarily because of a genetic peculiarity, usually a peculiarity of temperament. A child who is relatively fearless, or unusually impulsive, or given to intense fits of rage, for example, may be too difficult for average parents to control and steer clear of trouble. The larger and most important genus of the ASPD family consists of those people whom I call sociopaths. Many of these people might have become law-abiding and productive citizens had they been reared by healthy, competent, and socialized parents. Because their actual parents were incompetent and/or unsocialized themselves, however, sociopaths are likely not only to have been untrained, neglected, or abused but also to have inherited some of the same temperamental problems that kept their parents locked in the grim confines of the underclass.

The genus of sociopaths is the group that is growing-metastasizing-so rapidly that it already threatens to overwhelm our criminal justice system. Wolfgang and associates studied two cohorts of boys born in Philadelphia, the first in 1945 and the second in 1958 (Tracy, Wolfgang, & Figlio, 1990). Of the 1945 cohort, 6% became chronic criminals responsible for 61% of the Uniform Crime Report (UCR) Index Crimes (and 69-82% of the violent crimes). Of the 1958 cohort, 8% were chronic recidivists, accounting for 68% of the UCR Index Crimes. Based on the 50% increase in the incidence of ASPD since 1984, we can estimate that perhaps 12% of the males born in Philadelphia in 1970 may be recidivist criminals by now. According to the broader Epidemiological Catchment Area study (Robins & Regier, 1991), the incidence of childhood conduct disorder (CD) among males born from 1961 to 1972 was nearly three times higher than the incidence among men born from 1926 to 1945, and the incidence of adult ASPD, which by definition must be preceded by CD, has increased in parallel.

#### Is There an Antisocial Personality?

The Multidimensional Personality Questionnaire (MPQ; Tellegen & Waller, 2008) is a widely used self-report inventory with 11 factor-analytically derived scales plus three second-order factors defined by 10 of the 11 trait scales. The first factor, Positive Emotionality, is defined by the traits of Well-Being, Social Potency, Achievement, and Social Closeness. Negative Emotionality is defined by Stress Reaction, Alienation, and Aggression, while the third factor, Constraint, is made up of Control (vs. impulsiveness), Harm Avoidance, and Traditionalism.

We were able to obtain scores on the MPQ from 67 inmates at Oak Park Heights,<sup>2</sup> Minnesota's maximum-security prison that receives offenders transferred primarily from other adult male institutions, men who are classified as extreme risks to the public. The inmates who completed the MPQ, most of whom would meet diagnostic criteria for ASPD, had been convicted of serious crimes; 31 were serving long terms for murder. The men in this sample were assured that neither the fact of their participation nor their resulting scores would become part of their prison records. The only incentive offered for participation was that they would later be given a computer-derived analysis of the results and told how their scores compared with those of men in general.

Because the MPQ is a self-administered inventory and requires high school reading skills, a proportion of the inmate population could not be sampled, but there is no reason to think that the participants differed temperamentally from the nonreaders. We also collected MPQs from more than 850, 30-year-old male twins (Lykken, 2000) and used their scale means and standard deviations (SDs) to convert each inmate's scores into *T*-scores, which have means equal to 50 and SDs equal to 10.

Figure 2.1 shows the MPQ *T*-score means for the 67 inmates. The profile has below-average scores on the scales that determine the Positive Emotionality superfactor of the MPQ, high scores on those comprising the Negative Emotionality superfactor, and reasonably average scores on the scales that comprise the third superfactor, Constraint. However, the vertical dashed lines reveal that these serious criminals showed a great deal of variation on nearly all 10 traits. Some had really low scores on Well-Being and Achievement, combined with frighteningly high scores on Alienation and Aggression. Many other inmates, serving equally long



**FIGURE 2.1.** Mean scores of the 67 Oak Park inmates on 10 trait scales of the MPQ. The vertical lines represent one standard deviation above and below each scale mean and reveal that this group of serious offenders was substantially more variable on nearly every scale than was the group of 850 noncriminal young men, for which the mean scores on this graph would be 50 and the standard deviation would be 10.

sentences, produced high scores on Positive Emotionality, low scores on Negative Emotionality, and high scores on Control, Harm Avoidance, and Traditionalism. The behavior leading to a diagnoses of ASPD may therefore result from a variety of genetic and/or experiential sources.

Figure 2.2 shows the MPQ T-score means for the 22 inmates scoring highest, and the 22 scoring lowest, on Harm Avoidance. The high scorers appear quite benign, deviating from average only in their elevation on Harm Avoidance, indicating above-average fearfulness. I have previously argued (Lykken, 1957, 1995) that a boy who is innately relatively fearless will not react well to punishment or intimidation, the techniques most commonly relied on for the socialization of the young, and he may therefore be inclined to seek those peers in the street who admire his fearlessness and, in this way, to become a psychopath. Corroborating this idea, Figure 2.2 shows that the relatively fearless third of the inmate sample display the antisocial profile of high Negative Emotionality combined with low Positive Emotionality and low Constraint. Krueger, Caspo, Moffitt, Silva, and McGee (1996), in a longitudinal study of a normal birth cohort, found that this same pattern of temperament to be associated with antisocial deviance in adolescents.

Thus, while at least one-third of these inmates showed variants of an antisocial profile of MPQ scores, at least another third of these men, serving long terms in a maximum-security prison, showed variants of normal, even harmless-looking, profiles. In fact, for eight of the 10 MPQ scales in Figure 2.1, these 67 inmates showed a within-group variance ranging from 40 to 340% higher than the norm group's variance on the same scales. Unless we are willing to suppose that one-third of these prisoners were innocent and mistakenly convicted, this small dataset demonstrates that even the persons who commit the most serious crimes are not all cut from the same cloth and, in fact, show wide within-group variations in their personality profiles.

# **Socialization of Children**

How do most children avoid becoming social misfits? Probably in much the same way as the young of other social mammals learn the rules of their communities, through the monitoring and example of their elders. In southern Africa during the 1990s, the population of white rhinos was being depleted by violence. They were being murdered, not by poachers but by young male elephants who



**FIGURE 2.2.** Mean scores on trait scales of the MPQ for the 22 inmates from the Oak Park Heights sample (N = 67; see Figure 2.1) scoring highest, and the 22 scoring lowest, on the MPQ Harm Avoidance scale.

had been orphaned by culling operations in the Kruger National Park (Lemonick, 1997). The adults of the matriarchal herds had been shot and the baby elephants transported to other parks, where they grew up without the normal years of parental supervision—and they grew up to be dangerous outlaws. The salvation of the white rhinos, it turned out, was to bring in a number of mature bull elephants, truly "big daddies," who could dominate and socialize these delinquent young males and teach them how a bull elephant is supposed to behave (Fager, 2000).

Our species ranks between the elephants and the great apes, toward the low end, and the ants and Hymenoptera, at the high end, of the continuum of socialization. We are born with the capacity to develop a monitoring conscience that works to inhibit rule breaking. We can learn to feel empathy for our fellow creatures and to take satisfaction in acts of altruism. Most of us develop a sense of responsibility to our families and our community, a desire to pull our own weight in the group effort for survival. We may be the only species with a strong, clearly differentiated self-concept, so that we are motivated to emulate people whom we admire in order to feel good about ourselves.

Unlike the hardwired proclivities of the social insects, however, these prosocial inclinations do not emerge in us as well-formed instincts. Like our inborn capacity for language, they must be elicited, shaped, and reinforced by our interactions with other, older humans during our early development. Our poor success in rehabilitating persons who have reached young adulthood still inadequately socialized suggests that, again, like our language capacity, there may be a critical period for socialization. Unless it is evoked, sculpted, and made habitual in childhood, our human talent for socialization may wither and never develop.

### When Socialization Fails

Our ancient ancestors lived in relatively small, extended family groups, in which grandparents, uncles, aunts, and older cousins all could and undoubtedly did participate in socializing the young. We know that this method of childrearing, the system to which we are evolutionarily adapted, worked because, in most of the traditional societies that still exist in the semiprivacy of our shrinking jungles, all or most adults are expected to cooperate in the rearing of all or most of the tribe's children, and although some of these societies are quite violent, they experience little intramural crime.

For example, in her important study of mental illness in primitive societies, Murphy (1976) found that the Yupic-speaking Eskimos in northwest Alaska have a name, kunlangeta, for the man who, for example, repeatedly lies, cheats, and steals things, and does not go hunting, and who, when the other men are out of the village, takes sexual advantage of many women-someone who does not pay attention to reprimands and is always being brought to the elders for punishment. One Eskimo among the 499 on their island was called kunlangeta. When asked what would have happened to such a person traditionally, an Eskimo said that probably somebody would have pushed him off the ice when nobody else was looking (p. 1026).

Because traditional methods of socialization are so effective in tribal societies, where the extended family rather than just a particular parent-pair participate in the process, the *kunlangeta* probably possesses inherent peculiarities of temperament that make him unusually intractable to socialization. Such a person I classify as a "psychopath," an individual in whom the normal processes of socialization have failed to produce the mechanisms of conscience and habits of law-abidingness that normally constrain antisocial impulses.

Some 50 years ago [at the time of the original writing], I conducted an experimental study of this type of antisocial character (Lykken, 1957). Since then, a substantial research literature on the psychopath has accumulated and, in this book, the authors summarize what we know now about these pathological individuals whose character defects seem to have a biological basis. Yet, as one now surveys the current state of crime and violence in the United States, it is clear that the role played by the primary psychopath is only one small (but important) part of this broader picture.

In the West, and especially in Western urban society, the socialization of children is entrusted largely just to the parents, often to a single parent, and if the parents are overburdened or incompetent or unsocialized themselves, then even a child of average temperament may grow up with the antisocial tendencies of a psychopath. I use the term "sociopath" to refer to persons whose unsocialized character is due primarily to parental failures rather than to inherent peculiarities of temperament. On the other hand, the psychopath is almost certain to be a bad parent, and the child who receives from a parent both an unsocialized environment and a hard-to-socialize temperament is doubly handicapped.

#### The Importance of Fathers

There is a striking correlation, at least in the United States, between fatherless rearing and subsequent social pathology. Of the juveniles incarcerated in the United States for serious crimes during the 1980s, about 70% had been reared without fathers (Beck, Kline, & Greenfeld, 1988; Sullivan, 1992). Of the antisocial boys studied at the Oregon Social Learning Center, fewer than 30% came from intact families (Forgatch, Patterson, & Ray, 1994). Of the more than 130,000 teenagers who ran away from home in the United States during 1994, 72% were leaving single-parent homes (Snyder & Sickmund, 1995). A 1994 study of "baby truants" in St. Paul, Minnesota—elementary school pupils who had more than 22 unexcused absences in the year—found that 70% were being reared by single mothers (Foster, 1994). Nationally, about 70% of teenage girls who have out-of-wedlock babies were raised without fathers (Kristol, 1994).

In Minneapolis, a survey by the county attorney of 135 children who had been referred for crimes ranging from theft, vandalism, and burglary to arson, assault, and criminal sexual conductvoungsters ages 9 or vounger-found that 70% of these children were living in single-parent (almost always single-mother) homes (Wiig, 1995). If the base rate for fatherless rearing of today's teenagers is 30% (which is the best current estimate [at the time this was originally written], although this rate is growing alarmingly), then one can calculate that the risk for social pathologies ranging from delinquency to death is about seven times higher for youngsters raised without fathers than for those reared by both biological parents. Calculation separately, based on reasonable assumptions, for white and black youngsters yields the same results for both (Lykken, 1995, p. 215).

Correlation does not, of course, prove a direct causal connection. Fatherless children may be at higher risk because single or divorced mothers tend to have to live in impoverished circumstances, often in bad neighborhoods. The biological parents of fatherless children may pass on to their offspring genetic disadvantages, lower IQs, or difficult temperaments. Women (and girls) who end up as single mothers may on average be less competent as parents, either because of their personal limitations or because parenting is simply too difficult and relentlessly demanding for most individuals to accomplish it successfully alone.

In an important paper, Harper and McLanahan (1998) analyzed the data from the National Longitudinal Survey of Youth (NLSY) to determine whether the increased crime rate among boys reared without fathers could be attributed to the fact that such children tend more often to be poor. to be black, to live in central cities, or to have been born to teenage mothers. Even after controlling for all of these factors, family structure remained the strongest predictor of the boys' incarceration by age 30. It is interesting that the presence of a stepfather did not decrease the risk associated with mother-only rearing, whereas boys reared by single fathers were no more at risk for serious delinquency-and subsequent sociopathy-than those brought up by both biological parents. This suggests that while the mother's role in childrearing is of central importance, the biological father functions as an important socializing role model.

#### **Causes of Crime**

Gottesman and Goldsmith (1994) represented the probability of crime or antisocial behavior as a multiplicative function of genetic and environmental factors. Although one cannot argue with the descriptive truth of this formulation, I prefer not to conflate, as this scheme does, the early developmental environment, which is, or should be, dominated by parental interactions, with the current environment of neighborhood and peers. An alternative formulation, which I favor, is to think of antisocial behavior as a multiplicative function of antisocial proclivities or *criminality* interacting with the temptations or protections of the immediate environment. Then, criminality in turn can itself be thought of as a product of genetic factors interacting with early experience, especially experience with parental figures.

By claiming that criminality is a function of temperamental or other innate peculiarities combined with inadequate parenting, I seem to be asserting a leaden platitude. But it is a very important first principle that will point us in the right direction. Many social scientists, sociologists, and anthropologists assume something quite different. Anthropologists since Franz Boas have been "taught to hallow" the idea that "all human behavior is the result of social conditioning" (Freeman, 1992, p. 26). Some psychologists, like Mischel (1981)<sup>3</sup> and Haney and Zimbardo (1998), have assumed that behavior is primarily situational and that person-factors-individual differences in traits such as aggressiveness or fearlessness-are unimportant. The classical studies of Hartshorne and May (1928) left generations of psychologists with the belief that "honesty," which sounds very much like "socialization," is also situational, that honesty is not in fact a coherent trait. Sociological theories, like that of Sutherland and Cressey (1978), which dominated criminological thinking during much of the last century, held with Rousseau that crime is a violation of man's natural impulses and must be learned, and many people, including some psychologists, still subscribe to Rousseau's idea that the child is a kind of noble savage, naturally good until corrupted by social influences. Rousseau was able to maintain this inverted image of reality because he abandoned his own children to the care of their mother, but it is difficult to understand how anyone who has actually reared a little boy could sustain such a notion.

All these assumptions are violated in some degree by the contention that most important criminal behavior can be understood in terms of an acquired trait called conscientiousness interacting with the criminal impulse, which varies with both the individual and the situation. Yielding to criminal temptation means that, at least momentarily, the impulse is stronger than the forces of restraint. Children differ innately in characteristics that influence both sides of this equation. Fear of the consequences is an important restraining force, and some children are innately more fearful than others. Relatively fearless children tend to develop an effective conscience less readily than most children do and therefore may be less constrained, not only by fear but also by guilt. Unusually impulsive children may act before they think about the consequences and thus fail to experience their internal restraints until it is too late.

Other innate differences among people influence the impulse side of the equation. A hottempered child is more sorely tempted to strike out than is one of a more placid disposition, and the newspapers daily report assaults and murders motivated solely by choleric temperament. Some sex criminals appear to possess a ravening, insatiable sex drive, whereas others seem to display a short-circuiting between the brain mechanisms for sex and aggression. For some people, risk itself is a powerful attraction because it can produce in them an excited "high" that is intensely gratifying—and many forms of criminal behavior provide this risk-produced high just as reliably as any bungee jump. Unsocialized people tend to do a poor job of socializing their own children. For this reason, people with hard-to-socialize temperaments tend to produce children with a double liability, children with difficult temperaments whose parents are unable or unwilling to socialize them.

Figure 2.3 illustrates the differences between psychopathy and sociopathy, and how these two troublesome syndromes are related to genetic factors and to parenting. The bell-shaped curve at the left of the figure indicates that most people are in the broad middle range of socialization, with a few saintly people very high on this dimension, and a few others—the criminals—very low. The horizontal axis represents parental competence, and the curve at the bottom assumes that most parents are average, some are incompetent, and a few are superparents.

The top curve in the body of Figure 2.3 represents what might happen to a child, call him Pat, whose innate temperament makes him truly easy to socialize; he is bright, nonaggressive, and moderately timid, with a naturally loving disposition. Like all little boys, he starts out life essentially unsocialized and, if his parents are totally incompetent, his neighborhood a war zone, and his peers all little thugs, Pat might remain marginally socialized. But boys like Pat tend to avoid conflict and chaos, they are attracted by order and civility, and they tend to seek out socialized mentors and role models. With even poor parenting, the Pats of this world tend to stay out of trouble.

The middle curve in Figure 2.3 represents Bill, a boy with an average genetic makeup, moderately aggressive, moderately adventurous. Because he is average, we can safely anticipate that average parents, living in an average neighborhood, will be able to raise Bill to be an average, law-abiding citizen. Incompetent parents, however, living in a disruptive neighborhood, will not succeed with Bill, who will remain a sociopath.

Mike, the bottom curve in the figure, is really difficult to socialize; he may be fearless, impulsive, or hostile and aggressive. The great majority of parents would find Mike too much to cope with, a perennial source of worry and disappointment. Mike's curve goes up on the far right of the figure because really talented parents or, more likely, a truly fortuitous combination of parents, neighborhood, peer group, and subsequent mentors, can



**FIGURE 2.3.** The socialization of three boys with different genotypes plotted as a function of parental competence. The top curve represents Pat, a boy with an easy-to-socialize temperament, who is likely to make it even with relatively incompetent parents. Hard-to-socialize children like Mike, represented by the bottom curve, are likely to become psychopaths unless their parents are unusually skillful or unless strong socializing influences are provided from other sources in their rearing environments. The great majority of youngsters have average genotypes like Bill's, represented by the middle curve. If Bill's parents are average or better in their parenting skills, or if Bill's peer group is uniformly well socialized, then Bill will turn out all right. But if Bill's parents are incompetent and neither the extended family nor the peer group compensates for their ineptitude, then Bill is likely to become a sociopath. From Lykken (1995, p. 11). Copyright © 1995 Lawrence Erlbaum Associates, Inc. Reprinted by permission.

sometimes socialize even these hard cases. Mike, in all his interesting varieties, constitutes the principle subject of this volume.

#### Some Genetic Risk Factors Are Emergenic

In the study involving noncriminal 30-year-old male twins referred to earlier, MPQ data were obtained from both members of 189 monozygotic (MZ, or identical) twin pairs and from 141 dizygotic (DZ, or fraternal) pairs. The intraclass twin correlations for the DZ twins were less than half as large as those for the MZ twins for all the MPQ scales and superfactors and, as shown on the right in Table 2.1, these MZ–DZ differences were especially marked for the Harm Avoidance scale scores and for the Negative Emotionality and the Constraint superfactors. In another study of young male twins (Iacono & MacGue, 2002), 235 pairs of 17-year-old males who completed the MPQ produced similar MZ–DZ differences, as shown on the left in Table 2.1.

As we saw in Figure 2.2, among male prison inmates whose average age was similar to that of these twins, those with the lowest scores on Harm Avoidance showed below-normal scores on Constraint generally and also strongly elevated scores on the Negative Emotionality factor, especially on Alienation and Aggression. Even among the noncriminal male twins, the 118 (25%) least-socialized twins (those who admitted the most illegal or antisocial acts) differed significantly (p < .001) from the remaining 352 twins on these same variables.

When the MZ twin correlation is substantial, while the DZ correlation is near zero, it suggests that the genetic factors contributing to the trait variable in question combine interactively or configurally rather than additively. Such traits, although half or more of their variance is genetically determined, tend not to run in families because even slight changes in the gene configuration may yield great differences in the traits, and even a

Trait variable	17-year-old males		30-year-old males	
	MZ: 158 pairs	DZ: 77 pairs	MZ: 189 pairs	DZ: 171 pairs
Harm Avoidance Scale	.48	.02	.63	.06
Negative Emotionality Factor	.43	.10	.62	.09
Constraint Factor	.53	.14	.50	.03

 TABLE 2.1. Intraclass Correlations of 17-Year-Old and 30-Year-Old Male

 MZ and DZ Twins on Three Crime-Relevant Traits Measured by the

 Multidimensional Personality Questionnaire

*Note.* Because correlations for DZ twin pairs are closer to zero than to half the value of correlations for MZ pairs, these traits, each of which is a risk factor for antisocial behavior, exhibit appreciable heritability but do not tend to run in families.

traited parent is unlikely to pass on to an offspring all required components of the configuration in the random half of that parent's own genome.

Thus, if low Harm Avoidance or fearlessness is one source of primary psychopathy, and if this trait is emergenic (at least in younger males), then one can understand why primary psychopathy seems to occur almost as frequently in the offspring of wellsocialized parents as it does among the underclass. Moreover, if Negative Emotionality and Constraint are also emergenic, at least among younger males, that fact may help explain why some children of even the most poorly socialized parents manage to find socialized mentors and rise out of the underclass (see Dash, 1996; Lykken, 2000).

## **Noncriminal Psychopathy**

How can a psychopath not be a criminal? Suppose Mike does have unusual parents who do not rely on threats and punishment but, instead, show Mike the joys of being treated with respect and being loved-parents who find positive ways of eliciting socialized behavior and then rewarding that behavior with affectionate pride. If Mike's psychopathy is a result of one of the subtle brain malfunctions that are conjectured in later chapters, then even the most talented parents may be disappointed. But if Mike's "problem" is merely that he is relatively fearless, then those parents might produce a hero instead of a hoodlum. Some historical figures who, I believe, had the "talent" for psychopathy but who did not develop the full syndrome and achieved great worldly success include Winston Churchill (Carter, 1965; Manchester, 1986, 1988), the African explorer Sir Richard Burton (Farwell, 1963; Rice, 1990), and Chuck Yeager, the first man to fly faster than sound (Wolfe, 1979; Yeager, 1985).

Even without such parents, if Mike is clever, he may avoid petty crimes and misdemeanors (or at least avoid getting caught) while boldly cultivating his innate charm and other talents to win success and status in legitimate society. If we can believe his biographer, Robert Caro (1982, 1988, 2002), Lyndon Johnson exemplified this syndrome. He was relatively fearless, shameless, abusive of his wife and underlings, and willing to do or say almost anything required to attain his ends. Both Hitler and Stalin were relatively fearless, clever men, unconstrained by guilt or pity, whose ruthless rise to power would not have been possible had they felt normal degrees of caution or conscience. But politics is not the only legitimate profession in which the psychopath can shine. Psychopathic shortages of fear, conscientiousness, and altruism have been, alas, observed in businessmen, investment counselors, media personnel, actors, and entertainers, even in at least one former chief judge of the state of New York (Lykken, 1995, pp. 36-37).

As used by the media, "psychopath" conveys an impression of danger and implacable evil. Hervey Cleckley (1941, 1955, 1976), one of the first and best students of this syndrome, gave a more accurate picture of the psychopath's antisocialism: "Not deeply vicious, he carries disaster lightly in each hand" (1955, p. 33). Like the sociopath, the psychopath is characterized by a lack of the restraining influence of conscience and of empathic concern for other people. Unlike the ordinary sociopath, the primary psychopath has failed to develop conscience and empathic feelings, not because of a lack of socializing experience but, rather, because of some inherent psychological peculiarity that makes him especially difficult to socialize. An additional consequence of this innate peculiarity is that the psychopath behaves in a way that suggests he is relatively indifferent to the probability of punishment for his actions. This essential peculiarity of the psychopath is not in itself evil or vicious, but, combined with perverse appetites, or with an unusually hostile and aggressive temperament, this lack of normal constraints can result in an explosive and dangerous package. Perhaps the best collection of examples of criminal psychopaths and vignettes of psychopathic behavior can be found in Hare's (1993) excellent Without Conscience, where he asserts that psychopaths can be found "in business, the home, the professions, the military, the arts, the entertainment industry, the news media, academe, and the blue-collar world" (p. 57).

In marked contrast to these dangerous characters, and illustrative of why psychologists find such fascination in the psychopath, is the case of Oskar Schindler, the savior of hundreds of Krakow Jews whose names were on Schindler's list. Opportunist, bon vivant, ladies' man, manipulator, unsuccessful in legitimate business by his own admission but wildly successful in the moral chaos of wartime, Schindler's rescue of those Jews can be best understood as a 35-year-old con man's response to a kind of ultimate challenge: Schindler against the Third Reich. Any swine could kill people under the conditions of that time and place; the real challenge—in the words that his biographer may have put in his mouth, the "real power"-lay in rescuing people, especially in rescuing Jews. Some parts of Stephen Spielberg's film Schindler's List (1993) do not fit with my diagnosis of Schindler as a primary psychopath, especially the scene near the end in which Schindler (portrayed by Oscar nominee Liam Neeson) breaks down and cries while addressing his Jewish workers. British filmmaker Jon Blair, whose earlier documentary film, Schindler, was truer to history than Spielberg's feature film, noted this same discrepancy: "It was slightly out of character, and, of course, it never actually happened,' Blair said" (in Richmond, 1994, p. 17).

#### NOTES

 See Harpur, Hare, and Hakstian (1989, p. 9). The overlap of ASPD with criminality is much lower for women, perhaps because ASPD criteria are male-oriented: In the large Epidemiologic Catchment Area study reported by Robins and Regier (1991), 55% of males but only 17% of females with ASPD were criminals.

- I am indebted to Dr. Kenneth Carlson at Oak Park Heights Correctional Facility for collecting these data and sharing them with me.
- "Imagine the enormous differences that would be found in the personalities of twins with identical genetic endowment if they were raised apart in two different families.... Through social learning vast differences develop among people in their reactions to most stimuli they face in daily life" (Mischel, 1981, p. 311).

#### REFERENCES

- American Psychiatric Association. (1980). Diagnostic and statistical manual of mental disorders (3rd ed.). Washington, DC: Author.
- American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: Author.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: Author.
- Beck, A., Kline, S., & Greenfeld, L. (1988). Survey of youth in custody, 1987. Washington, DC: Bureau of Justice Statistics.
- Caro, R. A. (1982). The path to power. New York: Knopf.
- Caro, R. A. (1988). The years of Lyndon Johnson. New York: Knopf.
- Caro, R. A. (2002). Master of the Senate. New York: Knopf.
- Carter, V. B. (1965). Winston Churchill: An intimate portrait. New York: Konecky & Konecky.
- Cleckley, H. (1941). The mask of sanity. St. Louis, MO: Mosby.
- Cleckley, H. (1955). The mask of sanity (3rd ed.). St. Louis, MO: Mosby.
- Cleckley, H. (1976). The mask of sanity (5th ed.). St. Louis, MO: Mosby.
- Dash, L. (1996). Rosa Lee: A generational tale of poverty and survival in urban America. New York: Basic Books.
- Fager, J. (2000, August 22). The delinquents. In 60 Minutes II. New York: Columbia Broadcasting System.
- Farwell, B. (1963). Burton: A biography of Sir Richard Francis Burton. New York: Holt, Rinehart & Winston.
- Forgatch, M. S., Patterson, G. R., & Ray, J. A. (1994). Divorce and boys' adjustment problems: Two paths with a single model. In E. M. Hetherington, D. Reiss, & R. Plomin (Eds.), Stress, coping, and resiliency in children and the family (pp. 96–110). Hillsdale, NJ: Erlbaum.
- Foster, E. (1994, April 7). Baby truants at record high in St. Paul. *Minneapolis Star Tribune*, pp. 1, 8.
- Freeman, D. (1992). Paradigms in collision. Academic Questions, 5, 23–33.

- Gottesman, I. I., & Goldsmith, H. H. (1994). Developmental psychopathology of antisocial behavior: Inserting genes into its ontogenesis and epigenesis. In C. Nelson (Ed.), *Threats to optimum development: Biological, psychological and social risk factors* (pp. 69– 104). Hillsdale, NJ: Erlbaum.
- Haney, C., & Zimbardo, P. (1998). The past and future of U.S. Prison policy: Twenty-five years after the Stanford Prison Experiment. *American Psychologist*, 53, 709–727.
- Hare, R. D. (1993). Without conscience: The disturbing world of the psychopaths among us. New York: Pocket Books.
- Harper, C. C., & McLanahan, S. S. (1998, August). Father absence and youth incarceration. Paper presented at the annual meeting of the American Sociological Association, San Francisco, CA.
- Harpur, T. J., Hare, R. D., & Hakstian, A. R. (1989). Two-factor conceptualization of psychopathy: Construct validity and assessment implications. *Psychological Assessment*, 1, 6–17.
- Hartshorne, H., & May, M. (1928). Studies in the nature of character. New York: Macmillan.
- Iacono, W. G., & McGue, M. (2002). Minnesota Twin Family Study. Twin Research, 5, 482–487.
- Kristol, I. (1994, November 3). Children need their fathers. New York Times, p. A15.
- Krueger, R. F., Caspi, A., Moffitt, T. E., Silva, P. A., & McGee, R. (1996). Personality traits are differentially linked to mental disorders: A multi-trait, multi-diagnosis study of an adolescent birth cohort. *Journal of Abnormal Psychology*, 105, 299–312.
- Lemonick, M. D. (1997). Young, single, and out of control. Time, 150, 68.
- Lykken, D. T. (1957). A study of anxiety in the sociopathic personality. *Journal of Abnormal and Social Psychology*, 55, 6–10.
- Lykken, D. T. (1995). The antisocial personalities. Mahwah, NJ: Erlbaum.
- Lykken, D. T. (2000). The causes and costs of crime and a controversial cure. *Journal of Personality*, 68, 559–605.
- Manchester, W. (1986). The last lion: Winston Spencer Churchill: Visions of glory, 1874–1932. New York: Little, Brown.

- Manchester, W. (1988). The last lion: Winston Spencer Churchill: Alone, 1932–1940. New York: Little, Brown.
- Mischel, W. (1981). Introduction to personality (3rd ed.). New York: Holt, Rinehart & Winston.
- Murphy, J. M. (1976). Psychiatric labeling in cross-cultural perspective. Science, 191, 1019–1028.
- Partridge, G. E. (1930). Current conceptions of psychopathic personality. American Journal of Psychiatry, 10, 53–99.
- Rice, E. (1990). Captain Sir Richard Francis Burton. New York: Scribner's.
- Richmond, R. (1994, March 28). A look at the real Schindler tells the searing story. Los Angeles Daily News, p. 17.
- Robins, L. N., & Regier, D. A. (1991). Psychiatric disorders in America. New York: Free Press.
- Snyder, H. N., & Sickmund, M. (1995). Juvenile offenses and victims: A national report. Washington, DC: Office of Juvenile Justice and Delinquency Prevention.
- Spielberg, S. (Director). (1993). Schindler's list [Film]. Los Angeles: Universal.
- Sullivan, L. (1992, January 6). Families in crisis [Address by the then Secretary of Health and Human Services, delivered before the Council on Families in America of the Institute for American Values, p. 6].
- Sutherland, E., & Cressey, D. (1978). Principles of criminology (10th ed.). Philadelphia: Lippincott.
- Tellegen, A., & Waller, N. (2008). Exploring personality through test construction: Development of the Multidimensional Personality Questionnaire. In G. J. Boyle, G. Matthews, & D. H. Saklofske (Eds.), Handbook of personality theory and testing: Personality measurement and assessment (Vol. 2, pp. 261–292). London: Sage.
- Tracy, P. E., Wolfgang, M. H., & Figlio, R. M. (1990). Delinquency in two birth cohorts. New York: Plenum Press.
- Wiig, J. K. (1995). Delinquents under 10 in Hennepin County. Minneapolis, MN: Hennepin County Attorney's Office.
- Wolfe, T. (1979). The right stuff. New York: Farrar, Straus & Giroux.
- Yeager, C. (1985). Yeager: An autobiography. New York: Bantam Books.

# COMMENTARY

# A Minnesota Perspective on Lykken's "Psychopathy, Sociopathy, and Antisocial Personality Disorder"

# WILLIAM G. IACONO

ykken's chapter to the first edition of the Handbook of Psychopathy was published more than a decade ago, in the year of David Lykken's untimely death. It is not possible to offer an update pretending to know what David would say today, but it is possible to offer fresh perspective on some of the key themes articulated by one of psychopathy's pioneering investigators and theoreticians. Lykken's chapter, which builds on his now classic treatise on psychopathy (Lykken, 1995), like much of his written work, is rich with generative ideas. Many of these notions derived from his strong interest in the nature of the gene-environment interplay that characterizes the development of antisocial behavior. Minnesota is renowned as a major hub for twin research, and Lykken laid the foundation for this celebrity. His legacy includes launching the Minnesota Twin Family Study (MTFS), which led in turn to the establishment of the Minnesota Center for Twin and Family Research (MCTFR; Iacono & McGue, 2002; Iacono, McGue, & Krueger, 2006). The MCTFR encompasses a collection of longitudinal investigations of community samples of twin and adoptive children and their parents, with approximately 10,000 participants enrolled to date. The last decade of findings emanating from the Center has clear relevance to themes Lykken developed in his chapter, and he would no doubt have updated it in part based on this work.

## Lykken's Thesis

Lykken expressed his dissatisfaction with DSM-IV criteria for antisocial personality disorder (ASPD), which defined ASPD as a discrete syndrome rather than as a family of etiologically distinct antisocial disorders with underpinnings anchored in personality traits, genetic propensity, and environmental circumstance. The ASPD family, according to Lykken, includes (1) (primary) psychopaths, who are fearless and fail to be socialized due to an innately difficult temperament; (2) sociopaths (secondary psychopaths), who have a more manageable and less strongly genetically influenced temperament but turn to a life of crime because they are poorly socialized; and (3) noncriminal psychopaths, who cleverly apply their dispositional talents to advantage in legitimate society, perhaps as entrepreneurs or politicians.

As illustrated in Figure 2.3 of Lykken's chapter, environmental influence, particularly parental competence, is key to the development of the antisocial personalities, especially the sociopath. Lykken's view is that the fearlessness characteristic of psychopaths can be assessed with an omnibus personality inventory, Tellegen's Multidimensional Personality Questionnaire (MPQ). He makes the case that the MPO traits observed in inmates at a maximum security prison who were high in fearlessness (low in MPQ Harm Avoidance), when measured in twins, suggest emergenic inheritance for primary psychopathy (Lykken, McGue, Tellegen, & Bouchard, 1992). Emergenic traits, because they reflect the configural interaction of many genes rather than additive polygenic effects, are not passed on from parent to child despite showing heritability. Emergenesis can best be inferred when monozygotic (MZ) twins show resemblance to each other for a trait, but members of dizygotic (DZ) twin pairs, because their genes are not identically configured, differ from each other as much as unrelated people. In Table 2.1 of his chapter, Lykken presented evidence from two community twin samples (one from the MTFS) of a twinconcordance pattern for putative MPQ psychopathy-related traits that supported their emergenic inheritance (i.e., moderately strong MZ-twin correlation, with the corresponding correlation for DZ-twin pairs near zero).

# Personality Traits Undergirding Psychopathy

Lykken's formulations regarding the nature and etiology of differing variants of antisocial personality (per the title of his 1995 book) inspired a number of MTFS investigations. Benning and colleagues (Benning, Patrick, Blonigen, Hicks, & Iacono, 2005) set out to refine the ability of the MPQ to index fundamental dimensions underlying psychopathy identified in prior factoranalytic work (Benning, Patrick, Hicks, Blonigen, & Krueger, 2003) focusing on the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996). In three samples comprising over 1,700 total participants (i.e., MTFS twins, college students, and prison inmates), Benning, Patrick, Blonigen, and colleagues (2005) estimated scores on the two uncorrelated factors of the PPI from MPQ scale scores and used data from other personality measures related to externalizing and fear, along with scores on Hare's (2003) Psychopathy Checklist—Revised (PCL-R) to present compelling evidence for their construct validity as dimensional measures of psychopathy. One MPQ score variable (labeled "fearless dominance") represented the interpersonal facet of PCL-R Factor 1, and the other (labeled "impulsive antisociality") reflected the social deviance inherent to PCL-R Factor 2.

Of interest, in this and a subsequent investigation using MTFS sample data (Blonigen, Hicks, Krueger, Patrick, & Iacono, 2005), the impulsive antisociality factor correlated with clinically assessed measures of externalizing psychopathology, whereas fearless dominance correlated much less so. By contrast, fearless dominance showed robust negative associations with internalizing psychopathology. In a subsequent investigation again utilizing MTFS data, Benning, Patrick, and Iacono (2005) showed that affectively modulated startle and electrodermal responses assessed within a picture-viewing task showed patterns for fearless dominance similar to those found in psychopathic offenders, whereas physiological effects for impulsive antisociality resembled patterns reported for externalizing (Patrick, 1994, 1995).

This work has therefore yielded MPQ-based measures of psychopathy subdimensions with solid psychometric properties, which could be credibly employed to evaluate Lykken's behavioral genetic hypotheses regarding the etiology of primary and secondary psychopathy. Consistent with his conjecture that those high in psychopathic characteristics need not be criminals, these studies have also shown that psychopathic traits can be effectively assessed in a noncriminal community sample, and exhibit expected correlates with criterion measures of various types.

# Are Psychopathic Personality Traits Emergenic?

Blonigen and colleagues (2005) built on the work of Benning, Patrick, Blonigen, and colleagues (2005) by comparing how similar MZ and DZ twins were on these two MPQ-estimated psychopathy dimensions. Using 1,252 MTFS twins (i.e., 626 pairs), and consistent with what Lykken found for his MZ twins in Table 2.1, Blonigen and colleagues reported MZ correlations of .44 and .50, respectively, for fearless dominance and impulsive antisociality. The DZ correlations also differed significantly from zero for both fearless dominance (.20) and impulsive antisociality (.24)—with magnitudes approximately half those found for MZ twins, as would be expected for genetic additivity. This line of investigation was furthered by Hicks and colleagues (2012), who expanded the sample to 2,604 twins and reported similar MZ and DZ correlations for these two trait dimensions. Not surprisingly given their phenotypic independence, the two psychopathy-related dimensions were also genetically uncorrelated.

These nonzero DZ correlations provide refutation of the emergenic hypothesis, at least as it relates to these two psychopathy-related trait dimensions. Because DZ twins are more difficult to recruit than MZ twins (something Lykken himself showed; see Lykken, McGue, & Tellegen, 1987), large numbers of DZ pairs are needed to obtain representative samples for reliably estimating DZ similarity. Hence, it is possible that the results Lykken reported in his chapter stem from reliance on relatively small, unrepresentative DZ twin samples. The reasonableness of this interpretation is supported by the fact that Lykken's near-zero DZ personality correlations were derived in part from a subsample of MTFS twins, a subsample that was incorporated into the much expanded MTFS samples examined in the Blonigen and colleagues (2005) and Hicks and colleagues (2012) studies. Whatever the case, the preponderance of currently available twin data argues against MPQ-estimated psychopathic dimensions representing other than polygenic additivity. Importantly, however, and consistent with Lykken's expectation, both psychopathy facets were appreciably heritable, and the evidence supporting their phenotypic and genetic independence is consistent with Lykken's postulates regarding the etiological heterogeneity of antisociality.

It may nevertheless be the case that the configural interaction among genes accounts for at least some of the genetic variability in psychopathy. Relevant to this, molecular genetic studies of behavioral traits have largely failed to uncover genetic variants associated with those traits. This has been the case for externalizing proneness, which has been the subject of two MCTFR genomewide association studies (GWAS; McGue et al., 2013; Vrieze et al., 2014). The association results for common gene variants related to externalizing proneness, quantified as a composite of five antisocial and substance dependence symptom and problem behavior measures, are presented in Commentary Figure 1. This Manhattan plot reveals that using over 7,000 MCTFR participants and applying a conventional statistical cutoff of p $< .05 \times 10^{-8}$ , none of the over 500,000 examined single-nucleotide polymorphisms (SNPs) showed significant genomewide association with the externalizing composite variable.

Genomewide complex trait analysis (GCTA; Yang, Lee, Goddard, & Visscher, 2011) was also



**COMMENTARY FIGURE 1.** Manhattan plot of individual SNP associations, with a composite measure of externalizing derived from McGue et al. (2013). The plot depicts the distribution of  $-\log_{10}$  (*p*-values) ordered by SNP location on a chromosome for N = 7,235 participants from the MCTFR. The bold black line at 7.3 indicates the genomewide significance level ( $.05 \times 10^{-8}$ ) that must be reached for an SNP to show significant association.

applied to each of the five externalizing measures to provide an index of "SNP heritability," or the degree to which SNPs in unrelated people (i.e., a subsample of the 7,000 who were not biologically related to each other) account for their degree of externalizing phenotypic similarity assuming the genetic variance in the externalizing measures reflects the combined additive effect of all alleles weighted equally. Two important findings emerged from the GCTA analyses. First, the results confirmed the presence of SNP heritability, indicating that even though no single SNP accounted for significant variance in externalizing, when taken in combination, the SNPs on the gene chip supported the heritability of externalizing measures at a molecular level. Second, the obtained SNP heritabilities indicated that only a fraction of the heritable variance documented in the biometric analysis of the twins and their parents included in the GWAS was accounted for by the measured SNPs.

This discrepancy between heritability estimated from biometric modeling of twin and family data and GCTA SNP heritability has been observed for a wide variety of complex phenotypes in psychology and medicine. It has been characterized as the "missing heritability problem," and has been interpreted as indicating that nonadditive genetic effects, such as interactions among genes, may be important contributors to individual differences in traits such as externalizing. Extraordinarily large samples with genomewide molecular genetic data will be needed to address this possibility as it applies to facets of psychopathy, but such sample sizes are not beyond reach—being attainable, for example, by harmonizing phenotypes and pooling data across multiple samples (see, e.g., Genetics of Personality Consortium, 2015). Patrick and colleagues have already begun the ground work needed to accomplish this far-reaching objective for facets of psychopathy using the MPQ (Brislin, Drislane, Smith, Edens, & Patrick, 2015) and other personality inventories (Hall et al., 2014; Sellbom et al., 2016).

# Are Psychopathic Traits Differentially Heritable?

The notion that primary psychopathy is strongly heritable, whereas environmental context figures prominently for secondary psychopathy can be evaluated using the two MPQ proxy measures for these constructs. In Blonigen and colleagues (2005), the heritability estimates for Fearless Dominance and Impulsive Antisociality were .45 and .49, respectively, and not significantly different from each other. Hicks and colleagues (2012) reported essentially the same heritability estimates for a much larger MTFS sample than that studied by Blonigen and colleagues, again showing them to be equivalent for the two psychopathy dimensions, with no gender differences.

Hicks and colleagues (2012) also examined the nature of the association of these trait dimensions to the environmental context present during adolescence. The contextual variables included quality of parent-child relationship, peer affiliation, school achievement/engagement, and stressful life events. All of the contextual variables were correlated with Impulsive Antsociality, indicating that greater environmental adversity was associated with higher levels of this psychopathy facet. The associations with Fearless Dominance were weak and inconsistent. The environmental measures were all found to be heritable, with Impulsive Antisociality accounting on average for 24% of the genetic variance in these measures. In addition, genetic effects accounted for most of the phenotypic association (76%) between Impulsive Antisociality and the contextual measures.

These results suggest that the connection between Impulsive Antisociality and environmental adversity is genetically mediated, reflecting a gene-environment correlation wherein impulsive antisociality increases the likelihood of exposure to environmental adversity. The results for Fearless Dominance, by contrast, indicate that this trait dimension has little to do with exposure to environmental risk. This pattern of results further confirms the etiological distinctness of these two dimensions. However, they do not support the idea that primary psychopathy is more strongly heritable than secondary psychopathy. To the extent that impulsive antisociality is a proxy for secondary psychopathy and is more strongly associated with environmental context, they also do not suggest that exposure to environmental risk is causal. Instead, the results suggest that shared genes influence both the development of impulsive antisociality and exposure to environmental adversity.

Available evidence indicates that it is generally advantageous to be raised by a mother and a father (e.g., Rector, 2012). However, as Lykken (1995) noted, rearing by unsocialized parents may be deleterious even to offspring of average temperament, who otherwise would be at relatively low risk for antisociality. As an illustration of this unfortunate effect, Jaffee, Moffitt, Caspi, and Taylor (2003) found in a twin-family study that time fathers spent away from their children was correlated with the antisociality of their offspring. However, children reared by antisocial fathers in this study tended to have high levels of conduct disorder, and behavioral genetic analyses revealed that this effect reflected the "double whammy" of the genetic and environmental risk these children faced. Using MTFS families, Blazei, Iacono, and McGue (2008) expanded on these results by showing that the rates of many types of antisocial behavior in offspring increased as antisocial fathers spent more time rearing them.

Further extending this line of inquiry by using the adoptive siblings who are part of the MCTFR, Bornovalova and colleagues (2014) found that maladaptive parenting by mothers and fathers was associated with the development of childhood antisociality in both biological and adoptive offspring. Because adoptive parents and children are not genetically related to each other, this finding indicates that poor parenting constitutes a direct environmental effect on the development of externalizing tendencies in offspring. Consistent with Lykken's (1995) thesis, the results of these various investigations point to the importance of both fathers and competent parenting to the socialization of children.

# **Concluding Comments**

In this perspective, I have reviewed how David Lykken's chapter on the nature of antisocial personality and psychopathy might be reevaluated given progress made over the past decade. My review has been selective, focusing on work arising from the MCTFR, a research center that stands as part of Lykken's legacy of accomplishmentcarried out largely by Minnesota investigators inspired by his generative ideas and status as a leader in the conceptualization of antisocial personality. These articles support most of his contentions in showing that there are etiologically distinct variants or subdimensions of antisociality, that they are undergirded by personality characteristics that can be assessed through self-report in noncriminal populations, and that they are appreciably heritable. Parenting, especially from fathers, is important to the socialization of children. I do not know whether or how Lykken might modify his notion that primary psychopathy is more heritable than secondary psychopathy, or that psychopathic traits are not emergenic based on research using MPQ proxy measures of psychopathy. However, I am certain he would have been pleased to see how his ideas inspired these creative investigations. I know that, at the very least, he would have looked forward to a rewrite of his chapter with these new empirical findings at hand.

#### ACKNOWLEDGMENTS

Preparation of this commentary chapter was supported by the National Institute on Drug Abuse (NIDA) Grant Nos. DA 036216 and DA 005147.

#### REFERENCES

- Benning, S. D., Patrick, C. J., Blonigen, D. M., Hicks, B. M., & Iacono, W. G. (2005). Estimating facets of psychopathy from normal personality traits: A step toward community epidemiological investigations. Assessment, 12, 3–18.
- Benning, S. D., Patrick, C. J., Hicks, B. M., Blonigen, D. M., & Krueger, R. F. (2003). Factor structure of the psychopathic personality inventory: Validity and implications for clinical assessment. *Psychological As*sessment, 15, 340–350.
- Benning, S. D., Patrick, C. J., & Iacono, W. G. (2005). Psychopathy, startle blink modulation, and electrodermal reactivity in twin men. *Psychophysiology*, 42, 753–762.
- Blazei, R. W., Iacono, W. G., & McGue, M. (2008). Father–child transmission of antisocial behavior: The moderating role of father's presence in the home. *Journal of the American Academy of Child and Adolescent Psychiatry*, 47, 406–415.
- Blonigen, D. M., Hicks, B. M., Krueger, R. F., Patrick, C. J., & Iacono, W. G. (2005). Psychopathic personality traits: Heritability and genetic overlap with internalizing and externalizing psychopathology. *Psychological Medicine*, 35, 1–12.
- Bornovalova, M. A., Cummings, J. R., Hunt, E., Blazei, R., Malone, S., & Iacono, W. G. (2014). Understanding the relative contributions of direct environmental effects and passive genotype–environment correlations in the association between familial risk factors and child disruptive behavior disorders. Psychological Medicine, 44, 831–844.
- Brislin, S. J., Drislane, L. E., Smith, S. T., Edens, J. F., & Patrick, C. J. (2015). Development and validation of triarchic psychopathy scales from the Multidimensional Personality Questionnaire. *Psychological Assessment*, 27, 838–851.
- Genetics of Personality Consortium: de Moor, M. H., van den Berg, S. M., Verweij, K. J., Krueger, R. F., Luciano, M., et al. (2015). Meta-analysis of genomewide association studies for neuroticism, and the

polygenic association with major depressive disorder. JAMA Psychiatry, 72, 642–650.

- Hall, J. R., Drislane, L. E., Patrick, C. J., Morano, M., Lilienfeld, S. O., & Poythress, N. G. (2014). Development and validation of triarchic construct scales from the psychopathic personality inventory. *Psychological Assessment*, 26, 447–461.
- Hare, R. D. (2003). The Hare Psychopathy Checklist-Revised. Toronto: Multi-Health Systems.
- Hicks, B. M., Carlson, M. D., Blonigen, D. M., Patrick, C. J., Iacono, W. G., & McGue, M. (2012). Psychopathic personality traits and environmental contexts: Differential correlates, gender differences, and genetic mediation. *Personality Disorders*, 3, 209–227.
- Iacono, W. G., & McGue, M. (2002). Minnesota Twin Family Study. Twin Research, 5, 482–487.
- Iacono, W. G., McGue, M., & Krueger, R. F. (2006). Minnesota Center for Twin and Family Research. *Twin Research and Human Genetics*, 9, 978–984.
- Jaffee, S. R., Moffitt, T. E., Caspi, A., & Taylor, A. (2003). Life with (or without) father: The benefits of living with two biological parents depend on the father's antisocial behavior. *Child Development*, 74, 109–126.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment*, 66, 488–524.
- Lykken, D. T. (1995). The antisocial personalities. Hillsdale, NJ: Erlbaum.

- Lykken, D. T., McGue, M., & Tellegen, A. (1987). Recruitment bias in twin research: The rule of twothirds reconsidered. *Behavior Genetics*, 17, 343–362.
- Lykken, D. T., McGue, M., Tellegen, A., & Bouchard, T. J., Jr. (1992). Emergenesis: Genetic traits that may not run in families. *American Psychologist*, 47, 1565–1577.
- McGue, M., Zhang, Y., Miller, M. B., Basu, S., Vrieze, S., Hicks, B., et al. (2013). A genome-wide association study of behavioral disinhibition. *Behavior Genetics*, 43, 363–373.
- Patrick, C. J. (1994). Emotion and psychopathy: Startling new insights. Psychophysiology, 31, 319–330.
- Patrick, C. J. (1995, Fall). Emotion and temperament in psychopathy. *Clinical Science*, pp. 5–8.
- Rector, R. (2012). Marriage: America's greatest weapon against child poverty (Special Report from Domestic Policy Studies Department). Washington, DC: Heritage Foundation.
- Sellbom, M., Drislane, L. E., Johnson, A. K., Goodwin, B. E., Phillips, T. R., & Patrick, C. J. (2016). Development and validation of MMPI-2-RF scales for indexing triarchic psychopathy constructs. Assessment, 23(5), 527–543.
- Vrieze, S. I., Feng, S., Miller, M. B., Hicks, B. M., Pankratz, N., Abecasis, G. R., et al. (2014). Rare nonsynonymous exonic variants in addiction and behavioral disinhibition. *Biological Psychiatry*, 75, 783–789.
- Yang, J., Lee, S. H., Goddard, M. E., & Visscher, P. M. (2011). GCTA: A tool for genome-wide complex trait analysis. *American Journal of Human Genetics*, 88, 76–82.

# CHAPTER 3

# The PCL-R Assessment of Psychopathy

Development, Properties, Debates, and New Directions

> ROBERT D. HARE CRAIG S. NEUMANN ANDREAS MOKROS

he construct of psychopathy is becoming increasingly more important to the clinical and criminal justice systems and to society in general. The dominant instrument for the clinical and forensic assessment of psychopathy is the Psychopathy Checklist-Revised (PCL-R; Hare, 2003), the primary focus of this chapter. We describe its origins as a 22-item research scale (now referred to as the PCL; Hare, 1980); its development, administration, psychometric properties, and factor structure; and its uses in basic and applied research. We also provide brief descriptions of the direct derivatives of the PCL-R, and discuss associations between psychopathy as measured by the PCL-R and antisocial personality disorder (ASPD). We address recent concerns and debates about the "field" reliability of the PCL-R and its derivatives (referred to as the PCL scales) when used to make decisions about individuals, especially in an adversarial context. We provide an overview of recent work on the use of structural equation modeling (SEM) for understanding relations between PCL-R factors and a variety of external correlates. We discuss the use of latent profile analysis (LPA) for delineation of "variations on the theme" of psychopathy. Finally, we suggest several directions and paradigms for new

research, including a person-oriented approach to understanding the correlates of the psychopathy construct and its implications for the community.

Other chapters in this volume address the various roles played by the PCL scales in clinical and forensic contexts, and in basic and applied research. The PCL-R is based firmly on a widely accepted clinical and empirical tradition, and serves as a nexus or anchor for recent research and discussions concerning the nomological network of psychopathy (Benning, Patrick, Salekin, & Leistico, 2005; Crego & Widiger, 2015; Hare, Neumann, & Widiger, 2012; Poythress et al., 2010; Vachon, Lynam, Loeber, & Stouthamer-Loeber, 2012). The instrument filled a diagnostic and assessment void by providing researchers and clinicians with a common metric that has demonstrated reliability and validity in an array of populations and contexts (e.g., Felthous & Sass, in press; Gacono, 2016; Hare, 2003; Kiehl & Sinnott-Armstrong; Patrick, 2006b). The past 20 years have seen a sharp rise in use of the PCL-R in the criminal justice system worldwide (DeMatteo, et al., 2014; Guy, Kusaj, Packer, & Douglas, 2015; Hurducas, Singh, de Ruiter, & Petrila, 2014; Neal & Grisso, 2014; Singh, Bjørkly, & Fazel, 2016), and the scholarly literature on this instrument is extensive and growing rapidly. As of this writing (November 2017), hundreds of chapters, scores of books and special journal issues, and more than 1,500 articles have used or referred to the PCL scales (Web of Science; *http://wokinfo.com*).

Because of its prominence as an international standard for the clinical/forensic/research assessment of psychopathy, and in recognition of the important role it plays in the criminal justice system, investigators and commentators have subjected the PCL scales to unusually intense scrutiny and critical analyses, both conceptually and statistically. It has fared well, but several issues remain, including the extent to which the strong reliability of PCL assessments conducted for basic or applied research extends to areas in which the assessments have direct implications for an individual, such as civil commitment proceedings, parole decisions, treatment options, and so forth. In many cases, the issue is related to adversarial or allegiance effects, as noted below.

In addition, whereas some investigators have debated the factor structure of the PCL-R, others have expressed concern that the PCL-R has become the construct, stifling development of alternative measures of psychopathy, and that it has led to construct drift by deviating from the writings of Cleckley (1941/1976) and other early clinicians. There has been considerable discussion about the role of antisociality, fearlessness, and anxiety in the psychopathy construct. We discuss these and related current issues below (also see Hare, 2016; Hare & Neumann, 2008, 2010; Hare et al., 2012; Miller & Lynam, 2015; Neumann, Hare, & Johansson, 2013; Neumann, Hare, & Pardini, 2015; Skeem & Cooke, 2010).

# **Clinical Tradition**

Modern conceptualizations of psychopathy are based on the integration of a long clinical tradition—much of it psychodynamic in nature—with the theories, concepts, and methodologies of behavioral science. There are many historical reviews of the early clinical writings on psychopathy, generally described as a combination of inferred personality traits and socially deviant behaviors (e.g., Arieti, 1963; Berrios, 1996; Hare & Cox, 1978; Hervé, 2007; Karpman, 1961; McCord & McCord,1964; Meloy, 1988; Millon, Simonson, & Birket-Smith, 1998; Schneider, 1950; see Patrick, Chapter 1, and Lykken, Chapter 2, this volume). McCord and McCord (1964), for example, viewed the psychopath as a selfish, impulsive, aggressive, and loveless individual, who feels no guilt or remorse for behavior that is often appalling by most societal standards. Buss (1966) described psychopathy as a personality disorder in which there is a fundamental incapacity for love or true friendship; a lack of insight, guilt, or shame; an inability to control impulses or to delay gratification; unreliability in fulfilling obligations; pathological lying; thrill seeking; poor judgment; disregard for societal conventions; and asocial and antisocial behavior. Kurt Schneider (1950) described several types of psychopathic individuals, including the "affectionless psychopath," with features similar to those described by other clinicians, including Cleckley (1941/1976).

Karpman (1961) described two forms of psychopathy, aggressive-predatory and passive-parasitic, each characterized as callous, two-dimensional persons able to simulate emotions and affectional attachments when it is advantageous to do so. In such individuals, social and sexual relations with others are superficial but demanding and manipulative. Impulse and current needs often guide poor judgment and behavior, with the result that they frequently are in trouble. Their attempts to extricate themselves from difficulty often produce an intricate and contradictory web of blatant lies, coupled with theatrical explanations and promises.

Like Karpman (1961), Arieti (1963, pp. 307– 308) described two forms of psychopathy that differ from one another in their interpersonal and aggressive behaviors: the simple psychopath and the complex psychopath. Each of these clinicians took great pains to differentiate between these "true" psychopaths and individuals who share some psychopathic features but who differ in important ways (see the later section, "Person-Centered Evidence: LPA").

The clinical descriptions provided by Hervey Cleckley (1941/1976) in the various editions of *The Mask of Sanity* have been very influential in North American research, beginning with Lykken (1957) and Hare (1965). Cleckley's influence on the development of the PCL and the PCL-R is well known. As noted by Westen and Weinberger (2004, p. 599), "Virtually all current research on psychopathy presupposes the observations of a brilliant clinical observer [Cleckley 1941/1976] whose clinical immersion among psychopaths over 60 years ago still provides the foundation for the measure [the PCL-R] considered the gold standard in psychopathy research." Elsewhere, Minzenberg and Siever (2006, p. 251) criticized the criteria for ASPD in the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association [APA], 2000) for their lack in coverage of features described by Cleckley. Specifically, these authors stated that the criteria for APSD "consist almost exclusively of behavioral indicators, neglecting the affective-interpersonal features that appear to reflect much of the notion of a distinct personality type as described by Cleckley [1941/1976]." Furthermore, they noted that "to address these issues, Hare and colleagues revived the construct of psychopathy, operationally defined by the Psychopathy Checklist, presently available in a revised version" (p. 251).

# The PCL Scales: Descriptive Overview<sup>1</sup>

#### Editions

Detailed descriptions of the origins and development of the PCL scales are available elsewhere (Hare, 1991, 2003; Hare, Black, & Walsh, 2013; Hare & Neumann, 2006). Hare and Neumann provided a detailed account in the first edition of this handbook (Patrick, 2006b). Briefly, in the 1960s and 1970s, researchers used a variety of assessment and diagnostic procedures, most conceptually and empirically unrelated to one another (Hare, 1985). Because there was no reliable, valid, and generally acceptable method for the assessment of psychopathy, it was difficult or impossible to compare results from different researchers and studies. This prompted Hare, his research staff, and students to attempt development of a common metric for the assessment of psychopathy by combining personality traits and antisocial behaviors, in line with clinical tradition. These efforts resulted in a 22-item scale (Hare, 1980), later referred to as the Psychopathy Checklist (PCL). Factor analyses of the PCL items, each scored on a 3-point scale, led to a solution with two correlated factors, labeled Factor 1: Selfish, callous, and remorseless use of others and Factor 2: Chronically unstable and antisocial lifestyle, or Social deviance (Harpur, Hakstian, & Hare, 1988; Harpur, Hare, & Hakstian, 1989). In 1980, we began to disseminate a mimeographed manual for use by other investigators (Hare & Frazelle, 1980). The introduction of the PCL and its two-factor structure led to a sharp increase in research on psychopathy, its dimensions, and their correlates.<sup>2</sup>

Comments and concerns from fellow researchers indicated that it was important to make several improvements to the PCL. In 1985, Hare began to circulate a draft version of the revision throughout the research community. Subsequently, he and his staff fine-tuned and clarified the scoring criteria in order to make the manual (and the instrument) easier for other investigators to use. A 77-page formal manual appeared as the Hare PCL-R (Hare, 1991). Although some commentators expressed concern that explicit measures of low trait anxiety and trait fearlessness were not included in the list of PCL-R items, recent research (described in the section on Affect and the PCL-R) indicates that the current items adequately reflect these two traits (Neumann, Hare, & Johansson, 2013).

The second edition of the PCL-R appeared in 2003 at an expanded length of 222 pages, with detailed psychometric and validation data for 10,896 North American male and female offenders, substance abusers, sex offenders, African American offenders, forensic psychiatric patients, and offenders in several other countries. The PCL-R items and their scoring criteria remained the same as those in the 1991 edition. At the time, there were no compelling grounds for making substantive revisions to the PCL-R items. Modifications of the scoring criteria for several items might have made them easier to apply in some contexts, but at the risk of introducing subtle, though potentially important, changes in the meaning of PCL-R scores. For this reason, and to maintain continuity with the large research and clinical literature on the PCL-R that had developed over the preceding decade, the items and their scoring criteria remained unchanged from the first edition. This was a conservative strategy, but one that is consistent with recommendations for determining the need for revisions to a psychological test or instrument (Knowles & Condon, 2000; Silverstein & Nelson, 2000; Strauss, Spreen, & Hunter, 2000).

In producing the 2003 revision of the manual, Hare sought to minimize the misuse of the PCL-R, especially where it guides or influences adjudication and treatment decisions. One of the most important requirements for proper use of the PCL-R is familiarity with the current literature. However, it became apparent that many of those who generated psychological reports for the criminal justice system or testified in court relied primarily on material published in the 1991 manual. The 2003 manual provided users with an extensive review of the then extant literature on PCL-R assessment of psychopathy. Nonetheless, it remains extremely important for users to keep abreast of the current literature on psychopathy, especially concerning its implications for minority and legal issues (Edens, Petrila, & Kelley, Chapter 30, this volume; Ogloff, Lyon, & Shepherd, 2016). An up-to-date list of references is available at *www.hare.org/references*.

#### **Qualifications for Use**

The PCL scales find wide use in basic and applied research, including the mental health and criminal justice systems. The qualifications for their use in clinical and forensic work are more stringent than are those for research given that ratings of psychopathy may have important implications for the individual and for society (Blais & Forth, 2014; Boccaccini, Chevalier, Murrie, & Varela, 2015; Book, Forth, & Clark, 2013; Hare et al., 2013; Rufino, Boccaccini, Hawes, & Murrie, 2012). It is not sufficient for users of the PCL-R and its derivatives to be familiar only with the contents of a given manual. It is incumbent upon those who use a manual for clinical and forensic purposes to remain abreast of the current clinical and empirical literature on psychopathy. Users should understand the basic principles and limitations of psychological testing and interpretation, and ensure that they conduct their assessments in accordance with appropriate professional and legal standards for psychological testing. They also must have enough clinical and forensic training and experience to use the instrument appropriately (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 2014). The importance of training and experience has been emphasized by Hare (1991, 2003, 2007) and in edited volumes by Gacono (2000, 2016), Häkkänen-Nyholm and Nyholm (2012), and Hervé and Yuille (2007), and is illustrated in a study by Boccaccini, Murrie, Rufino, and Gardner (2014). Several clinicians and researchers have provided important advice on the clinical use of the PCL scales and on reporting the results of an evaluation (e.g., Book et al., 2013; Forth, Bo, & Kongerslev, 2013; Forth, Kosson, & Hare, 2003; Gacono, 2016; Hare, 2003; Hare et al., 2013). Properly used, the PCL-R provides reliable scores for the clinical construct of psychopathy. Evidence for the validity of these assessments is varied and extensive, as indicated by several hundred empirical studies and reflected in the content of many of the chapters in this volume.

#### **Psychopathy Checklist—Revised**

The PCL-R is a 20-item construct rating scale for use in research, clinical, and forensic settings (see Table 3.1, left panel). Raters score each item of the PCL-R on a 3-point ordinal scale (0, 1, or 2) to the extent they judge it to be applicable to a given individual. Total scores are dimensional, varying from 0 to 40, with a score of 30 often used as a research threshold for psychopathy (see "Dimensionality and Thresholds" section below). The standard administration procedure involves a semistructured interview, along with a review of file and collateral information, and application of specific scoring criteria to index inferred personality traits and behaviors related to traditional conceptions of psychopathy. However, it is not always possible to conduct interviews, and in such cases the rater may score the PCL-R from high-quality collateral and file information alone. The properties and external correlates of both methods are very similar. Harris, Rice, and Cormier (2013) argue that psychopathic individuals often engage in positive impression management during the interview, thus obtaining a lower PCL-R score than one obtained by an experienced rater with access only to extensive, detailed file information. In a review of the literature, these authors concluded that in risk assessments the predictive validity of file-only scoring of the PCL-R may exceed that of the standard method of scoring. The items that make up the Interpersonal and Affective (Factor 1) facets of the PCL scales have much to do with manipulation and deception. Clearly, this suggests that when the stakes are high, individuals high on psychopathy are likely to use positive impression management to influence evaluations of risk. Gillard and Rogers (2015) reported that male jail detainees with a moderate to high Factor 1 score were more successful at using positive impression management to reduce their scores on several risk instruments than were those with lower Factor 1 scores.

#### Factor Structure

The items of the PCL-R fall conceptually and statistically into distinguishable sets, or factors. Various factor structures have been proposed, including the original two-factor structure (Hare, 1991), a three-factor model using 13 items (Cooke & Michie, 2001), a four-factor model using 18 items (Hare, 2003; Neumann, Hare, & Newman, 2007), a two-factor model using 10 items (Walters, 2015), and a bifactor model using 20 items (Pat-

rick, Hicks, Nichol, & Krueger, 2007). In later sections, we describe these models and provide extensive evidence, based on confirmatory factor analysis (CFA), that a correlated four-factor model effectively represents the construct measured by the PCL-R and its derivatives. In these analyses we used the Mplus modeling program (Muthén, & Muthén, 1998-2017) and a robust weighted least squares statistical routine for parameter estimation (see Neumann et al., 2007). We also show that the pattern of intercorrelations among these first-order factors underpins a superordinate factor of psychopathy (i.e., a multifaceted syndrome). In addition, as Figure 3.1 indicates, it is possible to use these four factors to model a higher-order twofactor model (Hare & Neumann, 2008), consistent with the original two-factor model described by Hare (1991). Table 3.1 lists the factors and their constituent items for the PCL scales. More detailed accounts are available in a later section of this chapter ("The PCL-R Four-Factor Model of Psychopathy").

#### Reliability

Like its predecessor, the manual for the second edition provided strong evidence for the reliability of the PCL-R items and total and factor scores. Internal consistency was generally high (alpha, mean interitem correlation), as was interrater reliability for single ratings (intraclass correlation coefficient [ICC<sub>1</sub>]) and for the average of two ratings (ICC<sub>2</sub>). For the pooled standard assessment datasets, ICC<sub>1</sub> and ICC<sub>2</sub> values for the total score

TABLE 3.1. Items and Factors/Facets in the Adult, Youth, and Screening Versions of the PCL

PCL-R	PCL:YV	PCL:SV
Factor 1		Part 1
Interpersonal	Interpersonal	Interpersonal
1. Glibness/superficial charm	1. Impression management	1. Superficial
2. Grandiose sense of self-worth	2. Glibness/superficial charm	2. Grandiose
4. Pathological lying	4. Pathological lying	3. Deceitful
5. Conning/manipulative	5. Manipulation for personal gain	
Affective	Affective	Affective
6. Lack of remorse of guilt	6. Lack of remorse	4. Lacks remorse
7. Shallow affect	7. Shallow affect	5. Lacks empathy
8. Callous/Lack of empathy	8. Callous/Lack of empathy	6. Does not accept responsibility
16. Failure to accept responsibility	16. Failure to accept responsibility	
Factor 2		Part 2
Lifestyle	Behavioral	Lifestyle
3. Need for stimulation	3. Stimulation-seeking	7. Impulsive
9. Parasitic lifestyle	9. Parasitic orientation	9. Lacks goals
13. No realistic, long-term goals	13. Lack of goals	10. Irresponsibility
14. Impulsivity	14. Impulsivity	
15. Irresponsibility	15. Irresponsibility	
Antisocial	Antisocial	Antisocial
10. Poor behavioral controls	10. Poor anger control	8. Poor behavioral controls
12. Early behavioral problems	12. Early behavior problems	11. Adolescent antisocial behavior
18. Juvenile delinquency	18. Serious criminal behavior	12. Adult antisocial behavior
19. Revoke conditional release	19. Serious violations of release	
20. Criminal versatility	20. Criminal versatility	

*Note.* PCL-R, Psychopathy Checklist—Revised; PCL:YV, Psychopathy Checklist: Youth Version; PCL:SV, Psychopathy Checklist: Screening Version. Items are numbered; factors are **bolded**; facets are *italicized*. Items are scored according to the formal criteria contained in the published manuals for each instrument. In the PCL-R and the PCL:YV, two items (#11 and #17) contribute to the Total score but not to any of the factors or facets. F1 and F2 are the original PCL-R factors, but with the addition of item #20. The items are reprinted with permission of the copyright holders, Robert D. Hare and Multi-Health Systems.



**FIGURE 3.1.** Two-factor PCL-R higher-order representation of the four correlated factors model (N = 6,929). TLI = .93, SRMR = .05. From Hare and Neumann (2008). Reprinted by permission.

were .87 and .93, respectively. For the pooled file review datasets, alpha was .87 and the mean interitem correlation was .25. Reliabilities for U.K. and Swedish samples were comparable: For the U.K. sample, coefficient alpha was .79, ICC<sub>1</sub> was .89, and ICC<sub>2</sub> was .94; for the pooled Swedish samples, coefficient alpha was .81 (ICCs were unavailable).

A perusal of the literature indicates that researchers and graduate students have no difficulty in obtaining high interrater reliabilities for the PCL-R, with ICC<sub>1</sub> for total scores typically being in the .85–.90 range for a given study or laboratory. Similar values have been reported when comparing research-based ratings with those made by correctional psychologists (e.g., Brown & Forth, 1997; Willemsen, Vanheule, & Verhaeghe, 2011; Woodworth & Porter, 2002). Scores are also reliable in institutional settings when the raters are well trained and careful in their assessments. For example, Sample B-2 in the 2003 manual described the PCL-R scores of 448 male offenders assessed by at least two independent raters working in the Her Majesty's Prison Service (HMP). Adelle Forth and Hare trained the interviewers in this sample to a high standard in a series of workshops for HMP. The ICC<sub>1</sub> for this sample was .89, while ICC<sub>2</sub> was .93.

### **Psychopathy Checklist: Screening Version**

The foregoing comments on the psychometric properties, scoring protocols, and proper use of the PCL-R also apply to its direct derivatives, the Psychopathy Checklist: Screening Version (PCL:SV) and the Psychopathy Checklist: Youth Version (PCL:YV).

The PCL:SV (Hart, Cox, & Hare, 1995) is a 12-item version of the PCL-R (see Table 3.1, right panel) developed for use in the MacArthur Risk Assessment Study, where it was the strongest predictor of violence among civil psychiatric patients (Steadman et al., 1998). Like the PCL-R, each item is scored on a 3-point scale (0, 1, 2), with total scores that can vary from 0 to 24. A threshold score for psychopathy of 18 has proven useful for research purposes. The PCL:SV is related to the PCL-R conceptually, psychometrically, and empirically (Cooke, Michie, Hart, & Hare, 1999; Guy & Douglas, 2006; Hart et al., 1995), and exhibits the same factor structure, as indicated in detail below.

Although the PCL:SV sometimes serves as a screen for psychopathy (Guy & Douglas, 2006), its more common use is as a stand-alone instrument for research with forensic psychiatric populations and with noncriminals, including civil psychiatric patients. There is rapidly accumulating evidence for the construct validity of the PCL:SV, including its ability to predict aggression and violence in offenders, and in both forensic and civil psychiatric patients. The correlates of the PCL:SV are much the same as those of the PCL-R. In their review of the PCL:SV, Higgs, Tully, and Browne (2017) concluded, "This review demonstrates the overall reliability and validity of the PCL: SV in forensic samples. Psychometric properties were found to be comparable with the PCL-R in all aspects" (p. 12).

#### Psychopathy Checklist: Youth Version

The PCL:YV, a 20-item, age-appropriate modification of the PCL-R, is intended for use with adolescents ages 12–18 (see Table 3.1, middle panel). Like the PCL-R, each item is scored on a 3-point scale (0, 1, 2), with total scores that can vary from 0 to 40. It appears to have much the same psychometric properties and much the same correlates as its adult counterpart (Anderson & Kiehl, 2013; Book et al., 2013; Salekin, Neumann, Leistico, DiCiccio, & Duros, 2004; Vitacco, Neumann, Caldwell, Leistico, & Van Rybroek, 2006; Walters & Kiehl, 2015). Like the PCL-R, the PCL:YV appears to generalize well across ethnic groups and countries (e.g., Book et al., 2013; Dolan & Rennie, 2006; Hillege, de Ruiter, Smits, van der Baan, & Das, 2011; McCoy & Edens, 2006; Schrum & Salekin, 2006; Tsang et al., 2015).

Although there is little doubt about the reliability and validity of the PCL:YV, concerns arise with respect to its use in the criminal justice system. The main issues have to do with the dangers of labeling an adolescent as a psychopath; the implications of the PCL:YV for classification, sentencing, and treatment; the possibility that some features measured by the PCL:YV are found in typically developing youth; and the degree of stability of psychopathy-related traits from late childhood to early adulthood. Extensive discussions of these issues are available elsewhere (e.g., Book et al., 2013; Forth, Bergstrom, & Clark, 2016; Frick, Ray, Thornton, & Kahn, 2014; Lynam & Gudonis, 2005; Salekin & Lynam, 2010; Vitacco & Vincent, 2006). Briefly, although psychopathy and its features do not suddenly emerge in early adulthood, it would be inappropriate to label an adolescent as psychopathic or to use a high PCL:YV score as a basis for a harsher sentence or for exclusion from treatment. Although some adolescents may exhibit some features of psychopathy in certain contexts or for a limited time, a high score on the PCL:YV requires evidence that the traits and behaviors are extreme and manifest themselves across social contexts and over substantial times. High ratings of psychopathic traits are rare in community youth (Book et al., 2013). As Lynam and Gudonis (2005) put it following their review of the literature:

Psychopathy in juveniles looks much like psychopathy in adults. The same traits characterize these individuals at different developmental time points. Additionally, juvenile psychopathy acts like adult psychopathy. Like their adult counterparts, psychopathic juveniles are serious and stable offenders. They are prone to externalizing disorders. . . . As far as has been observed, juvenile psychopathy appears quite stable across adolescence. All of these findings replicate those observed in studies using psychopathic adults. (pp. 401–402)

#### Dimensionality and Thresholds

At the measurement level, psychopathy is structurally a dimensional construct. This applies to various psychopathy measures, including the PCL-R (Edens, Marcus, Lilienfeld, & Poythress, 2006; Guay, Ruscio, Knight, & Hare, 2007; Walters, Duncan, & Mitchell-Perez, 2007), the PCL:SV (Walters et al., 2007), the PCL:YV (Murrie et al., 2007), the APSD (Murrie et al., 2007), and the combination of the PCL:YV and Youth Psychopathic Traits Inventory (YPI) (Walters, 2014). It also applies to several self-report measures, including the Self-Report Psychopathy scale (SRP; Paulhus et al., 2016) and the Psychopathic Personality Inventory (PPI; Marcus, Lilienfeld, Edens, & Poythress, 2006). Interestingly, a recent study by Walters, Ermer, Knight, and Kiehl (2015) provided evidence of dimensionality for scores on differing PCL versions (PCL-R, PCL:YV) and in relations of PCL scores with gray-matter structure in distinct brain regions as assessed by neuroimaging.

The notion of a discrete point threshold for the presence or absence of psychopathy is at odds with evidence of dimensionality for psychopathic traits, and fails to take into account the measurement error and other factors associated with the PCL scales (see Mokros, Habermeyer, & Küchenhoff, 2017, for a discussion of the uncertainty of psychological and psychiatric diagnoses). Still, for some research and clinical applications, a categorical label of psychopathy may be more useful than a position on a dimensional scale. For example, Widiger and Mullins-Sweatt (2009) argued that dimensionality does not preclude the use of diagnostic thresholds for making clinical decisions about personality disorders. In this respect, cutoff scores may be useful in helping to select treatment options and for considering the relative costs of false negatives and false positives in risk assessment, as in the use of receiver operating characteristic (ROC) analyses (e.g., Douglas, Strand, Belfrage, Fransson, & Levander, 2005; Quinsey, Harris, Rice, & Cormier, 2005) or the likelihood ratio statistic (Mokros, Vohs, & Habermeyer, 2014). The difficulty is to determine the most appropriate cutoff score to use for such purposes. Hare (1991, 2003) suggested that a PCL-R score of 30 (representing one standard deviation above the mean score of 22.1 for the North American male offenders described in the 2003 edition of the PCL-R) was a reasonable research threshold for psychopathy in adults. Bolt, Hare, Vitale, and Newman (2004) conducted an item response theory (IRT) analysis with the four large groups (male and female offenders, male forensic psychiatric patients, male offenders scored from file information only) described in the 2003 edition of the PCL-R. Application of a multigroup graded response model to all four groups suggested that scalar equivalence held at least approximately for each group. Test characteristic curve (TTC) analyses indicated that a score of 30 had much the same meaning in each group with respect to the underlying trait ( $\theta$ ) of psychopathy; group differences at a score of 30  $(\theta = 1.5)$  were less than two points. Bolt and colleagues noted

the fact that the PCL–R generally performs similarly in terms of both expected scores and information for the comparison groups is encouraging. The differences observed with respect to the test characteristic curves do not appear to require the use of different cut scores in identifying individuals with psychopathy. Likewise, the reduction in information for each comparison group is even lower at  $\theta = 1.5$ . Thus the PCL–R appears to remain an effective instrument for distinguishing individuals with psychopathy from those without psychopathy within each comparison group. (p. 166)

However, the matter of score metric equivalence among PCL-R reference groups is an open question with respect to offenders and patients from different countries, cultures, and ethnic groups (see Fanti, Lordos, Sullivan, & Kosson, Chapter 22, this volume). Some researchers have used thresholds lower than 30, often because of lower scores in their sample than those in the PCL-R manual. For example, Cooke and Michie (1999) claimed that a PCL-R score of 25 in Scottish offenders reflected the same level of psychopathy as a score of 30 in North American offenders. Later, Cooke, Michie, Hart, and Clark, 2005a) argued that a PCL-R score of approximately 28 in United Kingdom offenders was equivalent to a score of 30 in North American offenders. Cooke, Michie, Hart, and Clarke (2005b) extended this argument to several European nations. Bolt, Hare, and Neumann (2007) were critical of the conclusions by Cooke and his colleagues, on the grounds that their methodology was flawed, involving, among other things, their selection of anchor items for their IRT analyses. Interestingly, Bolt and colleagues noted that in the Cooke studies (Cooke et al., 2005a, 2005b) the TCCs for the United Kingdom, European, and North American samples were coincident at a PCL-R score of 30 (i.e., at  $\theta$  = 1.5). It should not be assumed that a particular threshold score (e.g., 25) in one context reflects the same level of psychopathy as a different threshold (e.g., 30) in another context (Bolt et al., 2007; Mokros, Hollerbach, Nitschke, & Habermeyer, 2017; Mokros et al., 2013). Whatever the threshold, a cutoff score may help other researchers to understand (and to critically analyze) the working definition of psychopathy used by a given researcher in a particular context. In general, we discourage the use of a particular cut score for making clinical or forensic decisions with legal implications for an individual (cf. Edens, 2006; Hare, 1998a, 2003; Hare et al., 2013). A cut score is an artificial boundary on a continuum, not a gatekeeper for identifying the members of a taxon. As highlighted by Brenner and Gefeller (1997), both the measurement error in the individual case and population prevalence influence whether a diagnosis (based on a cut score) is actually true. Furthermore, uncertainty about the population prevalence and imperfect observer agreement (Mokros et al., 2017) may increase the rate of misclassification. Assigning individuals to categories based on cut scores glosses over these indeterminacies, whereas the use of confidence intervals and trait levels (as recommended in the PCL-R manual; Hare, 2003) makes them explicit.

#### Risk Assessment

Although not designed to assess risk for antisocial or criminal activities, the PCL-R's utility for these and other applied purposes is well established, in large part because the construct it measures plays a major role in understanding many of the problematic behaviors encountered by the criminal justice and mental health systems. Indeed, several meta-analyses indicate that the PCL scales perform about as well in risk assessment as instruments specifically designed for this purpose (Mokros, Vohs, et al., 2014; Yang, Wong, & Coid, 2010; in this volume, see Porter, Woodworth, & Black [Chapter 25], Ellingson, Littlefield, Vergés, & Sher [Chapter 26], Knight & Guay [Chapter 27], and Douglas, Vincent, & Edens [Chapter 28]).

The widespread use of the PCL scales for risk assessment is well known. For example, in a survey of American Board of Forensic Psychology diplomates, Lally (2003) reported that 63% of the respondents recommended the use of the PCL-R for assessing risk for violence, while 88% considered it acceptable for this purpose. Corresponding values for assessing risk for sexual violence were 62% and 91% for recommended and acceptable. Similarly, recent international surveys indicate that the PCL-R is one of the two most frequently used instruments for risk assessment, risk management, and risk monitoring (Hurducas et al., 2014; Singh et al., 2014). When the PCL: SV is included, the PCL scales are used at least as much for risk purposes as are tools expressly developed for risk assessment (see Part VI, this volume). Similarly, Neal and Grisso (2014) conducted an international survey in which 434 forensic examiners described their two most recent forensic evaluations. The PCL-R tied for the most frequently used tool for violent risk assessment, was second for sex offender risk assessments and civil commitment evaluations, and fourth for sentencing decisions.

In many jurisdictions, the PCL-R is part of the "best practices" protocols (e.g., Khiroya, Weaver, & Maden, 2009). Its position as the international standard for the clinical and forensic assessment of psychopathy "is unlikely to change in the near future, given continued efforts to translate and validate the test and the absence of an emerging competitor" (Storey, Hart, Cooke, & Michie, 2016, p. 144). This is a telling comment in light of this group's attempts over the past dozen years to develop an alternative to the PCL-R.

#### Some Current Debates Concerning the PCL-R

As indicated in the opening of this chapter, some investigators have raised concerns about the nature and use of the PCL-R. We provide a brief discussion of some of the main issues of current concern here. Other recent writings contain detailed examinations of these issues (e.g., Hare et al., 2013; Hare & Neumann, 2008, 2010; Neumann, Hare, & Johansson, 2013; Neumann, Hare, Mokros, et al., 2015).

#### Measure as Construct

A variety of sources indicate that the PCL-R and its derivatives have become the dominant instruments for the clinical and forensic assessment of psychopathy, and their use has resulted in the accumulation of a large body of replicable findings, both basic and applied. Many clinicians and researchers regard this as a good thing (e.g., see edited volumes by Gacono, 2016; Hervé & Yuille, 2007; Kiehl, & Sinnott-Armstrong, 2013), but others (e.g., Skeem & Cooke, 2010) have expressed concerns that the PCL-R has become too popular. They comment that many view it as the "gold standard" for the assessment of psychopathy, that it has undergone reification, that the measure has become the construct, and that its prominence has served to inhibit the development of alternative measures of psychopathy. In other words, it is the 800-pound gorilla in the room.<sup>3</sup> While it is true that many clinicians and researchers view psychopathy through the lens of the PCL-R and its derivatives, we have been explicit in describing the PCL-R as only one index of the psychopathy construct. For example, Neumann, Kosson, Forth, and Hare (2006, p. 146) stated that latent variable models of the PCL measures "should not be equated with the latent structure of the broader construct of psychopathy" (see also Hare, 1996; Hare & Neumann, 2010; Mokros et al., 2015).

Contrary to concerns that the PCL-R has inhibited research using other instruments, the diversity of measures of psychopathy (including various new self-report measures) represented at the biennial meetings the SSSP makes it clear that the prominence of the PCL scales has not impeded development of other tools. Consistent with this, Miller and Lynam (2015, p. 585) noted: "In general, the modern literature on psychopathy is impressive for the varied nature of assessment methods used (e.g., self, informant, interview, and file review), age groups (e.g., children, adolescents, and adults), samples (e.g., offender, community, clinical, undergraduate, corporate, online . . . and the variety of methodologies used to investigate potential etiological factors and outcomes, including brain imaging, . . . psychophysiological methods, and thin slice assessments." Beyond this, our position is that measures of psychopathy with wellestablished, theory-consistent empirical correlates can function as valuable frames of reference for basic and applied uses. At the very least, the PCL scales are a fundamental part of the nomological network of the psychopathy construct. As Crego and Widiger (2015) suggest, "There is unlikely to be a gold standard for determining which description [of the psychopathy construct] is valid and which is incorrect. The choice of which particular constellation to use in research or clinical practice is perhaps best made on the basis of which proves to be most useful for social or clinical purposes, or at best which represents the consensus view within the field" (p. 664).

#### **Construct Drift**

Salekin (2002) suggested that the definitions of psychopathy "have drifted from earlier conceptualizations provided by Cleckley and theorists before him" (p. 81). Others (e.g., Cooke & Michie, 2001) have argued that the PCL-R deviates from its roots in Cleckley because it includes antisocial behavior in the conceptualization and measurement of psychopathy. Detailed discussions of these and related issues are available elsewhere (Crego & Widiger, 2015; Hare & Neumann, 2008; Widiger & Crego, Chapter 12, this volume), and we provide only some brief comments here.

Hare did not base the PCL items on a simple, uncritical acceptance and application of the 16 characteristics listed in Cleckley's (1941/1976) clinical profile of psychopathy. Rather, the items emerged from a deep appreciation of the rich clinical material contained in Cleckley's writings, 15 years of experience and empirical research by Hare and his colleagues and students, and theoretical and empirical studies by other clinicians and researchers, all before the PCL was conceived and developed.

Hare and Neumann (2008) noted that Cleckley based his clinical profile on an unrepresentative sample of patients studied a long time ago, and that the profile was a clinical synopsis of what he considered to be typical of his patients, and not a formal assessment tool. This clinical profile evolved from 21 items in the first (1941) edition of *The Mask of Sanity* to 16 items in later editions (Hare et al., 2013). In other words, Cleckley's conceptualization of psychopathy evolved, just as have those of others, based on many decades of empirical research-much of it using the PCL-R. Hare and Neumann argued that the idea of construct drift from Cleckley's account is irrelevant to current conceptualizations of psychopathy, which are better informed by the extensive empirical research on the integration of structural, genetic, developmental, personological, and neurobiological research findings than by rigid adherence to early clinical formulations. In our view, considering the clinician's description as the construct is perhaps as problematic as considering the measure as the construct. It seems incongruous that empirical research findings should be judged by how well they fit with clinical observations described some 75 years ago. Along this line, Hare and Neumann (p. 217) argued that a "literal and uncritical acceptance [of Cleckley] by the research community has become problematical," as is the view that The Mask of Sanity is a "bible and those who deviate from its teachings [are] 'apostates' " (p. 224). Similarly, Crego and Widiger (2015) commented, "It is not really clear why one has to justify the inclusion of a trait largely on the basis of its endorsement by Cleckley" (p. 671).

The title of Patrick's (2006a) concluding chapter in the first edition of this volume was "Back to the Future: Cleckley as a Guide to the Next Generation of Psychopathy Research." Patrick had concerns about the omission from the PCL-R of items in Cleckley's clinical profile that are indicative of positive adjustment, or social boldness: Superficial charm and good intelligence; Absence of delusions and other signs of irrational thinking; Absence of nervousness and other psychoneurotic manifestations; Suicide rarely carried out. However, contemporary diagnostic systems and empirical research indicate that personality disorders fundamentally involve maladjustment, and are not understood in terms of positive adjustment (Livesley, 2007). Indeed, DSM-5 defines a personality disorder in terms of disturbances in self and interpersonal functioning that result in distress or impairment (American Psychiatric Association, 2013, p. 645). Indeed, DSM-5 defines a personality disorder in terms of experiences and behaviors that result in distress or impairment (American Psychiatric Association, 2013, p. 645). As Crego and Widiger (2015) put it, "It should go without saying that what makes a personality disorder a disorder is the presence of maladjustment, not superior adjustment" (p. 672). They further note that good intelligence and absence of delusions and suicide do not readily *morph* into positive adjustment, social poise, or boldness. Miller and Lynam (2012) have made similar points.

Perhaps what is in need of explanation and justification is not the exclusion of positive adjustment items from the PCL-R but rather their inclusion in Cleckley's clinical profile. Probably his psychopaths were less disturbed in some respects (e.g., suicidality, delusional thinking) than were his other psychiatric patients. This does not necessarily imply that his psychopaths were fully functioning, compared with the standard of mentally healthy individuals from the general community. Indeed, he used the term the "mask of sanity" for a reason.

We continue to benefit from the testable insights and speculations provided by Cleckley (1941/1976), but they cannot be the first and last word on psychopathy and its measurement, a point he himself made in extensive correspondence over the years with Hare. Detailed discussions of this issue are available elsewhere (Crego & Widiger, 2015; Hare & Neumann, 2008).

Ironically, commentators who believe that the PCL-R has strayed from its traditional roots seem less concerned that some self-report measures have only a tenuous connection to these roots. The issue becomes more complicated when various self-report measures of psychopathy use similar pools of items, or when researchers translate one self-report measure into the concepts and language of the other, thus moving further away from the construct of psychopathy described and operationalized in clinical samples.

#### Antisociality

Some commentators have suggested that Cleckley (1941/1976) and other influential clinicians defined psychopathy without reference to antisocial behaviors. Furthermore, they argue that antisocial behaviors merely are "downstream" from, or manifestations of, core personality dispositions, and that we should measure these dispositions independently of antisocial or socially deviant behaviors (e.g., Skeem & Cooke, 2010). How to do this is unclear given that many of the defining features of psychopathy (e.g., manipulation, deception, callousness, irresponsibility, impulsivity) are themselves antisocial or dissocial in nature (Hare & Neumann, 2008, 2010). Furthermore, the issue of what is "upstream" (core) and what is "downstream" (manifestation) is unclear, as we discuss here and later in this chapter. It is important to note that we do not consider *criminality* to be an essential part of the construct (Hare & Neumann, 2010), contrary to misrepresentations by Skeem and Cooke (2010).

The claims that Cleckley and other early clinicians did not include antisociality in their accounts of psychopathy are incorrect. Cleckley (1941/1976), in commenting on the relationship between psychopathy and psychosis, stated that he was "in complete accord" with a description of the psychopath as "simply a basically asocial or antisocial individual" (p. 370). Elsewhere in his book, Cleckley stated, "Not only is the psychopath undependable, but also in more active ways he cheats, deserts, annoys, brawls, fails, and lies without any apparent compunction. He will commit theft, forgery, adultery, fraud, and other deeds for astonishingly small stakes, and under much greater risks of being discovered than will the ordinary scoundrel" (p. 343). As stated by Patrick (2006a), "There is no question that Cleckley considered persistent antisocial deviance to be characteristic of psychopaths" (p. 608).

Neumann, Hare, and Pardini (2015) have provided extensive empirical evidence that antisociality is an integral part of the psychopathy construct. Lynam and Miller (2012) wrote that antisocial behavior (ASB) "plays a clear and prominent role in psychopathy according to Cleckley, Karpman, and Lykken. In fact, if there is an essential behavioral feature in common across the conceptualizations, it is the presence of ASB. Any description of psychopathy is incomplete without ASB. Any model of psychopathy is insufficient that doesn't attend to this core aspect" (p. 342). Many of the defining features of psychopathy (e.g., manipulation, deception, callousness, irresponsibility, impulsivity) are antisocial or dissocial in nature. Consistent with this perspective, Miller and Lynam (2015) listed the intertwining of psychopathy and ASB as one of five key advances in our understanding of psychopathy. They stated that in the absence of antisociality "psychopathy becomes a configuration of traits that is interesting to look at but that has little real world consequence, reducing psychopathy to a sort of boutique personality disorder" (pp. 587–588). Miller and Lynam referred to an article by Neumann, Hare, and Pardini (2015) as an important reminder of the strong link between psychopathy and ASB. Neumann and colleagues used SEM to examine model parameters for the four-factor PCL-R factor structure, using data from 18 samples that had used a PCL-based scale (N =52,957). The results indicated that antisociality is a core component of the psychopathy construct. Details are available in a later subsection ("PCL-R/SRP Model Parameters").

Some of the most compelling evidence that the emergence of an early and persistent pattern of ASBs is integral to psychopathy comes from behavioral genetics and developmental psychopathology (in this volume, see Viding & Kimonis [Chapter 7], Waldman, Rhee, LoParo, & Park [Chapter 14], and Frick & Marsee [Chapter 19]). For example, there are genetic links between overt antisocial behaviors and other features of psychopathy (Larsson et al., 2007; Viding, Blair, Moffitt, & Plomin, 2005), and early antisocial features predict the development of other features of psychopathy that occur at a later age (Forsman, Lichtenstein, Andershed, & Larsson, 2010). Several investigators argue that the early emergence of antisocial behavior, including deceptive and aggressive sexuality, is central to psychopathy (Book & Quinsey, 2003; Harris, Rice, Hilton, Lalumière, & Quinsey, 2007; Lalumière, Mishra, & Harris, 2008). Drawing on research in behavior genetics, psychology, sociobiology, and game theory, Mealey (1995b, p. 524) proposed that persons she termed "sociopaths" are "the product of evolutionary pressures which, through a complex interaction of environmental and genetic factors, lead some individuals to pursue a life-history strategy of manipulative and predatory social interactions." Later, Mealey (1995a) used the term "primary psychopathy" to refer a life-history strategy that is heavily influenced by genetically based biological, personality, and behavioral dispositions, and "secondary psychopathy" for a strategy influenced by adverse social and environmental forces. Glenn, Kurzban, and Raine (2011) have provided a detailed analysis of evolutionary, adaptive models of psychopathy and its constituent features, including antisociality.

As a final point, it is conceivable that ASB may be an even more salient indicator of psychopathy in adolescent, general community, or mental health settings than among adult offenders or forensic patients, where ASB is very common (Crego & Widiger, 2015). Lee Robins made a similar point in a conversation with Hare more than three decades ago (see Hare & Neumann, 2006, p. 61).

### Affect and the PCL-R

Although some clinicians (e.g., Cleckley, 1941/1976) and investigators (e.g., Hare, 2003) have argued that psychopathy is characterized by a general blunting of emotional experience, much of the empirical literature has focused on negative affect, especially anxiety and fear (see reviews by Brook, Brieman, & Kosson, 2013; Derefinko, 2015;

Hoppenbrouwers, Bulten, & Brazil, 2016; also see, in this volume, Hamilton & Newman [Chapter 4], Yang & Raine [Chapter 16], Blair Meffert, Hwang, & White [Chapter 17], and Patrick [Chapter 18]).

#### Anxiety and Fear

Clinicians and researchers long have debated the importance of anxiety and fear in understanding and assessing the psychopathy construct. Although the literature on these issues is vast, at present there is no clear resolution to the debate, perhaps in large part because it requires interpretation and evaluation of accounts and evidence from diverse sources, including clinical writings, self-reports, and the opinions of experts in the field. In addition, there are different views of the nature of "trait anxiety" and "trait fear," which Sylvers, Lilienfeld, and LaPrairie (2011) argue are related but distinct emotions. There also are different theoretical perspectives concerning what some view as low anxiety and fearlessness in the psychopathy construct, many based on recent advances in cognitive/affective neuroscience (e.g., Blair, 2005, 2013; Derefinko, 2015; Ermer, Cope, Nyalakanti, Calhoun, & Kiehl, 2012; Hamilton, Hiatt Racer, & Newman, 2015; Hoppenbrouwers et al., 2016; Lushing, Gaudet, & Kiehl, 2016; Raine & Glenn, 2014; Seara-Cardoso & Viding, 2015). Several extensive reviews of the literature on the relations between negative affect and psychopathy are available. Many of these involve the PCL scales but others involve various self-report measures of psychopathy. Many of these studies also use self-report measures of anxiety and fear, which is a problem in our view.

Discussion of this literature is beyond the scope of this chapter. Rather, we confine most of our discussion to the concerns expressed by many clinicians and researchers that the PCL instruments do not include specific items for anxiety and fear, and that this is inconsistent with Cleckley (1941/1976). Before addressing this issue, we refer to several recent empirical and theoretical analyses of the role played by anxiety and fear in psychopathy.

In three meta-analyses of the PCL scales, Derefinko (2015) suggested that the low anxiety construct comprises three components: anxiety, fear, and constraint. She concluded that the "findings suggest that although psychopathic individuals have deficits in inhibition/constraint, they do not necessarily exhibit a consistent absence of negative affect . . . [and] that while constraint composes a large part of psychopathy assessments, it is less clear how much anxiety lends to the construct" (p. 693). Similarly, in a meta-analysis, Hoppenbrouwers and colleagues (2016) concluded that fearlessness in psychopathy involves more a failure to respond to threat cues than a subjective feeling of fear.

Measures of fearlessness typically include many items pertaining to excitement seeking, sensation seeking, and impulsivity, which makes it difficult to determine whether psychopathy is associated with fearlessness per se or with impulsive disinhibition (Hare et al., 2012; Kubak & Salekin, 2009; Neumann, Hare, & Johansson, 2013). Furthermore, there is evidence that attentional processes play an important role in how psychopathic individuals respond-cognitively and emotionallyto what for others is an emotional trigger (Hamilton & Newman, Chapter 4, this volume; Zeier & Newman, 2013). This research suggests that trait fearlessness drives psychopathy less than do attentional strategies that limit the processing of cues needed to guide behavior. Newman's response modulation hypothesis holds that psychopathic behavior, including fear conditioning, emotional, and other behaviors, "reflect[s] a failure to process affective, inhibitory, and other potentially important information when it is peripheral to their ongoing goal-directed behavior" (Newman, Curtin, Bertsch, & Baskin-Sommers, 2010, p. 66). In an elaboration of this hypothesis, Wolf and colleagues (2012, p. 102) proposed "that psychopathy reflects an attention bottleneck that interferes with processing contextual information, including the timely processing of affective and inhibitory cues that initiate self-regulation."

Hamilton and colleagues (2015, p. 777) recently proposed an impaired information (II) model that integrates the research findings concerning the affective and cognitive aspects of psychopathy: "We propose that at the core of psychopathy lies a fundamental deficit in perceptual integration. Specifically, our II framework states that failure to rapidly bind components of multidimensional stimuli in psychopathy creates a perceptual bottleneck resulting in unelaborated mental representations and the development of abnormal topography in associative neural networks." They note (p. 770) that a central premise of II theory is that psychopathic individuals are "wired up" differently, quoting Hare, Williamson, and Harpur (1988, p. 87; also see Willamson, Harpur, & Hare, 1991). In effect, there is impaired integration of affective and cognitive mechanisms and circuits. Several decades ago, Hare proposed a much less elaborated version of this model, based on the available literature and the work of Damasio (1995). He raised the possibility that "psychopathy is associated with anomalies in cortical/subcortical structures and functional circuits responsible for the integration of cognition, affect, and behavior" (Hare, 1998b, p. 117).

#### ANXIETY AND FEAR: CLECKLEY'S ROLE

Some of Cleckley's writings on the role of anxiety and fear in psychopathy are ambiguous and open to a variety of interpretations. Interestingly, Cleckley mentioned fearlessness only once in the fifth edition of The Mask of Sanity (1976, p. 319), but as counterindicative of psychopathy. One of the items in his clinical profile was Absence of nervousness and other psychoneurotic manifestations, which some commentators equate to lack of anxiety. However, Hare and Neumann (2008, pp. 228–229) noted that Cleckley was somewhat unclear and inconsistent concerning the definition and role of this item, and of anxiety, in his conceptualization of psychopathy. In the first edition of The Mask of Sanity, the Clinical Profile devoted only half a sentence to the topic: "He is . . . usually free from any marked nervousness or other symptoms of psychoneurosis" (Cleckley 1941, p. 239; original emphasis). So are most normal people, particularly if we note the adjective "marked." Coverage in later editions increased to about half a page, although there are references throughout the texts to anxiety in one form or another. For example, Cleckley (1976, p. 340) stated that psychopaths show a "relative immunity from such anxiety and worry as might be judged normal or appropriate in disturbing situations." However, in the same edition (p. 259) he also noted: "The true psychopaths personally observed have usually been free, or as free as the general run of humanity, from real symptoms of psychoneurosis" (emphasis ours). Furthermore, he commented (p. 340, emphasis added) that psychopaths experience tension or uneasiness but that it "seems provoked entirely by external circumstances, never by feelings of guilt, remorse, or intrapersonal insecurity."

Clinical thinking and prototypicality ratings are important but must be considered in conjunction with empirical findings. For example, the omission of anxiety from the PCL scales was influenced by early analyses of Cleckley's 16-item clinical profile in which "absence of 'nervousness' or psychoneurotic manifestations" (Cleckley, 1976, p. 337) was unrelated to the other items in the profile (Hare, 1980, p. 337). Loney, Taylor, Butler, and
Iacono (2007) reported similar results in their attempt to develop a self-report version of the Cleckley items, the Minnesota Temperament Inventory (MTI). These authors stated: "A rational–empirical approach to item selection led to the removal of one item ('I am an anxious, nervous, and fearful person; tend to worry')" (p. 244).

As with anxiety, we suggest that the role of fearlessness in psychopathy depends on how it is defined and measured.

# THE PCL-R AND CLINICAL MEASURES OF ANXIETY AND FEAR

In commenting on the controversies concerning the roles of fearless dominance, boldness, and emotional stability in the psychopathy construct, Crego and Widiger (2015, p. 671) noted that the problem of "how best to validate their presence [in psychopathy] beyond simply obtaining the opinions of researchers and correlations with extant measures, is not entirely clear." The same concerns extend to extant measures of trait anxiety and fear, most of which use self-reports. Even if psychopathic individuals do score differently from others on these measures in predicted directions, it does not mean that the differences are pathological or of practical significance.

Although the PCL-R does not include items specific to anxiety and fear, research by Neumann, Hare, and Johansson (2013) indicates that other PCL-R items pick up these affective dispositions when described and rated according the format used to score other items. These investigators used confirmatory factor analysis (CFA) and SEM to assess relations of the four PCL-R factors with interview ratings of low anxiety and fearlessness, using data from a study of violent male offenders (Andershed, Douglas, & Skeem, 2004). Items designed to index low anxiety and fearlessness, formulated by these investigators, were part of the study protocol. The items mirrored the format of the other PCL-R items, with explicit criteria for scoring them on a 3-point scale (0, 1, and 2). The Low Anxiety item covered cognitive, emotional, and behavioral features associated with a relative absence of anxiousness. The Fearlessness item pertained to engagement in a variety of risky behaviors, with little evidence of subjective fear. Raters scored these items (jointly referred to as LAF: Low Anxiety, Fearlessness) as part of a standard PCL-R assessment protocol, using information from a semistructured interview and file records.<sup>4</sup> The data for the PCL-R items replicated the four-factor model of the PCL-R (Neumann et al., 2007). Additional CFAs incorporating the two LAF items indicated that these items, either individually or as a pair, could be placed on any of the PCL-R factors without any change in model fit. Furthermore, the two LAF items were correlated with one another (r = .64) and with each PCL-R factor (r's = .40–.60). A follow-up SEM included a separate LAF factor (i.e., specified using the two individual items as indicators). The superordinate PCL-R factor tor accounted for most of the covariance between the LAF items.

Findings from this study indicate that tendencies toward LAF, as assessed by clinical ratings, are represented in extant PCL-R items. The authors concluded that concerns about the absence of specific LAF items in the PCL-R are misplaced, and that psychopathy as indexed by the PCL-R entails a general attenuation of affective experience. In recent cross-cultural research (Hoppenbrouwers, Neumann, Lewis, & Johansson, 2015), there is also evidence of dysregulated affective experience in psychopathy.

#### **PCL-R Psychopathy and ASPD**

There is a large literature on the historical associations of the PCL scales with the DSM-III and DSM-IV diagnostic category of ASPD (APA, 1980, 1994). Several recent historical accounts of these associations are available (Crego & Widiger, 2015; Hare et al., 2012; Lynam & Vachon, 2012; Patrick, 2007; Warren & Burnette, 2013; Widiger & Crego, Chapter 12, this volume), so only salient details are summarized here, beginning with DSM-III (APA, 1980) in which the criteria for ASPD were based largely on the work of Robins (1966, 1978).

As discussed elsewhere (Crego & Widiger, 2015; Hare et al., 2012), the DSM-III strategy for operationalizing psychopathy may have unintentionally introduced a related but nonidentical construct to the field. The criterion set for DSM-III ASPD received considerable criticism for sacrificing validity to enhance reliability, and for omitting traditional features of psychopathy (in partial response to which "lacks remorse" was added as a criterion for ASPD in DSM-III-R). Furthermore, in forensic populations, the prevalence of DSM-III ASPD was two to three times higher than the prevalence of psychopathy, as measured by the PCL-R. The result was an asymmetric association between the PCL-R and ASPD, with most offenders attaining a high PCL-R score meeting the criteria for ASPD, but most of those diagnosed with ASPD not attaining high PCL-R scores. In this respect, it is noteworthy that ASPD is strongly associated with PCL-R Factor 2 items, but only weakly associated with Factor 1 items, leading to the concern that essential elements of psychopathy were not included in the criteria for ASPD. This concern also applies to ASPD as defined in DSM-IV and Section II of DSM-5.

In revising personality disorder definitions for DSM-IV, one objective was to bring ASPD closer to psychopathy as measured by the PCL-R. For this reason, the Field Trial for DSM-IV ASPD (Widiger et al., 1996) included a 10-item Psychopathy Criteria Set (PCS) derived from the PCL-R and the PCL:SV, consisting of five items representative of Factor 1 (Lacks remorse, Lacks empathy, Deceitful and manipulative, Inflated and arrogant selfappraisal, Glib and superficial) and five representative of Factor 2 (Early behavior problems, Adult antisocial behaviors, Impulsive, Poor behavioral controls, Irresponsible). Although these items generally fared well in the field trial, the criterion set for ASPD in DSM-IV remained the same as in DSM-III-R (APA, 1987). However, the Associated Features and Disorders section for ASPD (both in DSM-IV and in DSM-IV-TR; APA, 1994, 2000) stated that, within forensic populations, the diagnosis of ASPD may be facilitated by assessing traits and behaviors imported (without attribution or scoring instructions) from the 10-item PCS used in the DSM-IV Field Trial (Widiger et al., 1996). Had these imported traits been required for a diagnosis of ASPD, rather than being made optional in forensic contexts, the relationship between psychopathy and ASPD would be stronger.

#### ASPD in DSM-5

After years of debate about the need to bring the diagnostic criteria for ASPD into line with those for psychopathy, DSM-5 retained the DSM-IV criteria for ASPD (Section II, Diagnostic Criteria and Codes). Many clinicians and researchers saw this as a surprising development given earlier suggestions and proposals by the Personality Disorders Work Group for DSM-5. About this issue, Crego and Widiger (2015, p. 670) had this to say: "Ever since DSM-III was published, there has been a recurrent criticism of the APA diagnostic manual for failing to be fully commensurate with the conceptualization of psychopathy by Cleckley (1941/1976) and/or the PCL(-R) (Hare, 1980, 2003)." Crego and Widiger also noted that the Personality Dis-

orders Work Group initially intended to "shift the diagnosis of ASPD toward PCL-R and/or Cleckley psychopathy" (p. 668). For example, in early 2010, the Work Group proposed that ASPD be renamed *Antisocial/Psychopathic Type*, reflecting traits from domains of Antagonism and Disinhibition, ostensibly similar to PCL-R Factors 1 and 2, respectively. Samuel, Lynam, Widiger, and Ball (2012) had 170 experts perform prototypicality ratings of the traits proposed for ASPD, as well as those for five other proposed personality disorders. They reported (p. 6) that the "Work Group and the experts appeared to be in complete agreement about the traits that should and should not be used for the antisocial/psychopathic type."

Skodol and colleagues (2011, p. 140) stated that "a revised construct of ASPD that includes psychopathic personality features has been recommended for retention in DSM-5." Yet, in their rational for this proposal, no reference was made to the enormous body of research with the PCL scales. As Blashfield and Reynolds (2012, p. 826) noted, "Cleckley and Hare are well-known authors who defined how psychopathy is currently conceptualized; neither was referenced in the DSM-5 rationale." Lynam and Vachon (2012, p. 490) commented, "History and research suggest that ASPD and psychopathy should be combined in DSM-5," but that the issue apparently received little or no discussion in the literature or on the DSM-5 websites. Furthermore (p. 492), "the DSM Workgroup missed an opportunity to unify two classifications (ASPD and psychopathy) that history and research suggest have diverged mistakenly."

#### Alternative Trait Model

The door for some integration between ASPD and psychopathy remains slightly ajar in the dimensional-trait characterization of ASPD in Section III of DSM-5, which describes ASPD in terms of the traits of manipulativeness, deceitfulness, callousness, hostility, irresponsibility, impulsivity, and risk taking from the broad domains of Antagonism and Disinhibition. Anderson, Sellbom, Wygant, Salekin, and Krueger (2014, p. 676) suggested that use of these traits has the "potential to move the diagnosis of ASPD closer to the more useful construct of psychopathy and also allow for more flexibility in characterizing individuals with psychopathic personality traits."

These traits are included in the Personality Inventory for DSM-5 (PID-5; Krueger, Derringer, Markon, Watson, & Skodol, 2012), designed to operationalize the DSM-5 Section III dimensional-trait model in the domain of self-report. Strickland, Drislane, Lucy, Krueger, and Patrick (2013) reported that the PID-5 was related to the Triarchic Psychopathy Measure (TriPM) in theoretically expected ways, and that the findings may help to reconcile concerns about the representation of psychopathy in psychiatric nomenclature. They also noted (p. 336) that self-reports are useful "for indexing antisocial/psychopathic tendencies and personality more broadly," but that corroboration of their findings will require additional research "using alternative measurement methods such as face-to-face interview supplemented by archival file review."<sup>5</sup>

The alternative trait model in DSM-5 Section III also includes a *psychopathy specifier* for the traitbased diagnosis of ASPD, entailing the presence of three additional traits-low anxiousness, high attention seeking, and low social withdrawal-as indicators of the boldness construct of Patrick, Fowles, and Kreuger's (2009) triarchic model (for which empirical referents include the TriPM Boldness scale and the PPI-R Fearless Dominance factor). Not surprisingly, Anderson and colleagues (2014) reported that in university and community samples specifically recruited for having subclinical psychopathic proclivities, the PID-5 and the psychopathy specifier were related to the TriPM and the PPI, referred to as "extant conceptualizations of the psychopathy construct" (p. 690). However, the TriPM and PPI diverge in some ways from the traditional construct of psychopathy (Crego & Widiger, 2015; Evans & Tully, 2016; Hare et al., 2012; Lynam & Miller, 2012; Miller & Lynam, 2012; Neumann, Uzieblo, Crombez, & Hare, 2013), making it important to determine how the psychopathy specifier relates to the PCL scales. Few, Lynam, Maples, MacKillop, and Miller (2014, p. 72) noted that "the inclusion in the DSM-5 of the psychopathy specifier was somewhat surprising as there is little research examining its validity when measured in this way." These authors reported that DSM-5 psychopathy specifier traits were not significantly related to some measures of psychopathy (SRP, five-factor model of personality [FFM]) or externalizing scores but were related to fearless dominance, which they argue is not part of the psychopathy construct. However, several authors have argued otherwise (e.g., Lilienfeld et al., 2012; Lilienfield, Watts, Smith, & Latzman, Chapter 8, this volume; Murphy, Lilienfeld, Skeem, & Edens, 2016). The most recent research on the psychopathy specifier raises serious questions about its validity (Miller, Lamkin, Maples-Keller, Sleep, & Lynam, 2017).

It remains to be seen whether Section III of DSM-5 will facilitate our understanding and measurement of psychopathy, or prove useful in clinical, forensic, and other applications in which assessments have serious implications for the individual and society. The results of a recent study offer some encouragement in this regard. Wygant and colleagues (2016) reported that the PCL-R and its factors correlated significantly with the Section III ASPD traits (manipulativeness, deceitfulness, callousness, hostility, irresponsibility, impulsivity, and risk taking), whether scored during a PCL-R assessment or based on the self-report PID-5. These authors also found significant correlations between two of the three psychopathy specifier traits (Withdrawal and Attention Seeking) and scores on the PCL-R. In a personal communication to Hare (December 5, 2016), Wygant explained: "We used the structured PCL-R interview and file review to rate not only the PCL-R items but also the facet traits for the DSM-5 Section III model." The same raters scored the PCL-R and the ASPD traits, which makes it possible that the results were due partly to criterion contamination, although the authors attempted to minimize this possibility. The study represents a useful start in reconciling PCL-R and ASPD within the DSM-5 Section III framework.

#### Same, Similar, or Different Constructs?

There is good evidence from many studies, mostly task performance, that ASPD and PCL-R psychopathy are not identical constructs (e.g., Hare, 2003; Hare et al., 2012; Kosson, Lorenz, & Newman, 2006; Lynam & Vachon, 2012; Ogloff, 2006; Patrick, 2007; Poythress et al., 2010; Riser & Kosson, 2013; Venables, Hall, & Patrick, 2014). There is growing literature on the cognitive-affective neuroscience of psychopathy that demonstrates differences from ASPD (e.g., see reviews by Anderson & Kiehl, 2013; Blair, 2013; Boccardi, 2013; Glenn & Raine, 2014; Gregory et al., 2015; Kiehl, 2014; Kiehl & Sinnott-Armstrong, 2013; Koenigs, Baskin-Sommers, Zeier, & Newman, 2011; Kolla, Gregory, Attard, Blackwood, & Hodgins, 2014; Patrick & Bernat, 2009; Seara-Cardoso & Viding, 2015; Sundram et al., 2012; Viding & Mc-Crory, 2012; Yang & Raine, 2009; also see Part IV, this volume). In some of these studies, most or all participants meet the criteria for ASPD, but psychopathy still emerges as the key variable related to differences in brain structure and function.

As a final point, it is clear that in research and forensic settings, the assessment of ASPD has much less utility than does the assessment of psychopathy, which may help to explain why Blashfield and Intoccia (2000, p. 473) stated, after a computer search, that "antisocial personality disorder has a large literature but has shown relatively stagnant growth over the last three decades." In commenting on this conclusion, Crego and Widiger (2015, p. 669) had this to say: "If they had included psychopathy within their search, they would have likely concluded that the research was more truly alive and well, as much of the research concerning this personality disorder had shifted to studies of psychopathy."

## Field Use of the PCL-R

In addition to studies in which the PCL-R was administered for basic research purposes, in many studies it was administered as part of an institutional assessment battery-including "field" studies in which the scores on the PCL-R have potential implications for the handling of the offender or forensic psychiatric patient by the criminal justice system (level of supervision, treatment options, release decisions, etc.). Specific variants of field studies include the use of the PCL-R for sentencing, risk evaluations, preventative detention/ civil commitment hearings, and parole decisions (e.g., Guy et al., 2015; Hurducas et al., 2014; Lally, 2003; Neal & Grisso, 2014; Olver & Wong, 2015; Porter, ten Brinke, & Wilson, 2009; Serin, Brown, & De Wolf, 2016; also see Porter, Woodworth, & Black, Chapter 25, this volume; Douglas, Vincent, & Edens, Chapter 28, this volume).

We discuss two issues here. The first has to do with the reliability of PCL-R scores in institutional settings, and the second, with their reliability in contexts in which adversarial or allegiance effects may be in play. Notwithstanding the extensive evidence for the reliability of PCL scale scores conducted in various institutional settings, some commentators rightly note that even qualified clinicians can differ considerably in the scores they assign to individual offenders or patients, and that scores on the PCL scales may not be reliable enough for use in making decisions about the risk, treatment, and dispositions of individual offenders and patients. Such concerns are not specific to the PCL scales but apply to most psychological and psychiatric assessments in clinical and forensic practice. However, the unusual importance of the PCL-R in criminal justice settings is of special concern to some. We address two such concerns, one having to do with sexually violent predators and the other with parole decisions for offenders sentenced to life in prison ("lifers").

With respect to the PCL scales, it is interesting that researchers and their assistants, usually graduate students, have no difficulty in obtaining highly reliable scores in their research with offenders and forensic patients. What factors account for the lower reliability of scores for clinicians in the "field"? It is possible that researchers and their students are better trained in the administration of the PCL scales and are more objective than are many clinicians, and that the members of a given research team have access to much the same information about each offender or patient. Boccaccini and colleagues (2014, p. 343) noted: "One important difference between field studies and nonfield studies is that researchers typically require evaluators to complete intensive PCL-R training—and even complete formal reliability checks-before scoring for a nonfield study, whereas there is no such requirement for routine practice in the field."

It also is likely that the purpose and method for the assessments (standard vs. file-only) and the context in which they occur influence reliability. In routine institutional assessments, the reliability of PCL scores is uniformly high (Hare, 2003; Harris et al., 2013), even when they are obtained at different times. For example, Ismail and Looman (2018) compared the PCL-R scores of an unselected sample of 175 male offenders independently assessed 2-3 years apart, once at a Federal Assessment Center (T1) and later at a Federal Regional Treatment Center (T2). The mean PCL-R score remained about the same from T1 to T2 (24.2 and 23.6, respectively). Rater reliability generally was higher than that reported in the PCL-R manual (Hare, 2003, Table 5.1): .90 for total score, .78 for Factor 1, .90 for Factor 2, and between .76 and .93 for the four first-order factors. The authors concluded that PCL-R scores can be as reliable in applied settings as in research contexts, and emphasized the need for training, consultation, and adherence to the Manual guidelines, all issues covered in detail elsewhere (Gacono, 2016).<sup>6</sup>

Dåderman and Hellström (2018) reported similar results in their study of Swedish forensic psychiatric patients. The ICC (single rater, absolute agreement) was .89 for the Total score, .82 for Factor 1, .88 for Factor 2, and .78–.86 for the four facets. They stated, "These results stand in contrast to lower reliabilities found in a majority of field studies" (p. 234). Neumann, Hare, Pardini, and Brand (2017) obtained the PCL-R scores of a sample of 576 forensic psychiatric patients assessed on two occasions (average time between assessments = 16.5 months) by different well-trained, experienced clinicians from the Expertise Centre for Forensic Psychiatry (EFP) in the Netherlands. The EFP has an extensive national database of psychiatric, psychological, and behavioral variables for more than 3,000 patients held in Dutch forensic psychiatric hospitals under TBS ("being placed at disposal") legislation, which mandates treatment upon completion of prison terms for offenders convicted of serious sexual or violent offences judged to be at high risk to reoffend. The mean PCL-R total and factor scores for this patient sample were virtually identical across the T1 and T2 assessments, and ICCs (mixed effects for absolute agreement) between T1 and T2 were uniformly high: .86 for total score, and .84, .74, .86, and .90 for the Interpersonal, Affective, Lifestyle, and Antisocial factors, respectively. For these patients and those in the previously noted studies by Ismail and Looman (2016) and Dåderman and Hellström (2018), the PCL-R assessments had real-life implications for the offenders and patients, and the reliabilities of the PCL-R scores certainly were high enough for making informed decisions about them.

#### Sexually Violent Predator Evaluations

An important line of research is concerned with evaluator effects in scoring psychological scales for sexually violent predator (SVP) evaluations. For example, a Texas statute requires SVP evaluators to assess for psychopathy. In a study that did not deal directly with interrater reliability, Boccaccini and colleagues (2014) reviewed the files of 558 offenders scored on the PCL-R by 14 evaluators, 11 of whom stated that they had completed at least one formal PCL-R workshop. The authors reported that, for a variety of reasons, some evaluators routinely gave offenders unusually high or low scores, with the mean PCL-R score across the evaluators varying from 30.7 to 13.8. It is possible that certain evaluators were selectively assigned cases that appeared to be the most or least psychopathic, although the authors did not consider this likely. Five evaluators, three of whom conducted SVP evaluations for only a brief period, were responsible for the extreme PCL-R scores. The authors noted, "Although we do not know why these [three] evaluators stopped conducting SVP evaluations, it is possible that their contracts with the state were not renewed because of concerns about the quality of their work" (Boccaccini et al., 2014, p. 342). Furthermore, they noted, "Together, findings of smaller evaluator differences and stronger predictive validity among subsets of trained and prolific evaluators provide indirect, but potentially promising support for the value of PCL-R training and evaluation experience" (p. 343).

#### Parole Suitability for Offenders with Life Sentences

The PCL-R is used routinely in many jurisdictions to aid parole boards in determining suitability for early release from custody. For example, in California, the PCL-R is administered to offenders sentenced to "life with parole." Some investigators and public commentators have asserted, without empirical evidence, that a high score on the PCL-R is *the* primary factor in denying these offenders parole.<sup>7</sup> We describe the results of a recent study because it not only addresses this issue but also provides descriptive PCL-R data for a large sample of such offenders.

Guy and colleagues (2015) conducted a survey of California lifers evaluated by the Board of Parole Hearings (BPH) between January 2009 and November 2010, on average after 20.6 (SD = 7.0) years of incarceration. The authors investigated the extent to which several psychological instruments, including the PCL-R, predicted board decisions, 11% of which resulted in parole. Trained and experienced forensic psychologists working for the BPH completed the PCL-R along with two risk assessment measures, the Historical, Clinical, Risk Management-20 (HCR-20; Webster, Douglas, Eaves, & Hart, 1997) and the Level of Service/ Case Management Inventory (LS/CMI; Andrews, Bonta, & Wormith, 2004). The mean PCL-R score for 4,706 offenders was 14.2 (SD = 6.8), a surprisingly low value, even for a general prison population. The PCL-R total score was a strong predictor of the BPH decisions about parole suitability (area under the curve [AUC] = .73), with the strongest and weakest factor predictors being the Affective factor (AUC = .70) and the Antisocial factor (AUC = .63), respectively. However, the HCR-20 (AUC = .78) and the LS/CMI (AUC = .75) were somewhat stronger predictors of parole eligibility than was the PCL-R. The evaluators used these three instruments to derive a 5-point overall risk rating (ORR) to predict parole suitability, for which the AUC was .80. In explaining why the PCL-R was not the strongest predictor of a parole decision, Guy and colleagues acknowledged "the fact that important constructs tapped by the PCL-R likely would have been considered via assessment using the HCR-20" (p. 241). We note below that offenders with high scores on PCL-R Factor 1 may use positive impression management to lower their scores on the HCR-20 and other risk scales (see Gillard & Rogers, 2015, Harris et al., 2013).

An issue not addressed in the Guy and colleagues (2015) study is the impact on the BPH of scores of the PCL-R and other instruments obtained prior to the latest evaluations. Presumably, many offenders were assessed several times during their incarceration. Did those granted parole (mean PCL-R score for the hearing = 9.4, SD = 5.3) show appreciable decreases in PCL-R and other scores over the years, whereas those not granted parole (mean PCL-R = 14.5, SD = 6.7) failed to change? It seems likely that the BPH would have considered the *pattern* of scores and behaviors over time, not simply the results of a special assessment in advance of the parole hearing. Another related factor that could have affected results is the temporal stability of the inventories used (PCL-R, HCR-20, LS/CMI) over repeated assessments.

#### Adversarial/Allegiance Effects

In their recent survey of U.S. case law, DeMatteo and colleagues (2014) identified 348 cases involving the PCL-R from 2005 to 2011. They noted (p. 96) that the PCL-R "appears to be the most widely used measure of psychopathic traits in forensic settings around the world," that it is primarily a "prosecution tool," that challenges to its admissibility "were rare and typically unsuccessful," and that "on average, prosecution examiners reported PCL-R scores that were 7 points higher than defense examiners." Other investigators have reported similar discrepancies between the PCL-R scores of prosecution and defense experts (e.g., Edens, 2006). This is hardly surprising, given the adversarial/allegiance nature of prosecution/ defense testimony, and the opportunity for either side to engage in tactics that will give them an advantage.

The matter of bias by forensic evaluators is of considerable concern, not only for the PCL-R but for other instruments as well, including the Static-99R (Chevalier, Boccaccini, Murrie, & Varela, 2015; Helmus, Thornton, Hanson, & Babchishin, 2012). Most relevant reports describe uncontrolled field studies of SVP evaluations, but the allegiance effect also appeared to occur in a more controlled investigation by Murrie, Boccaccini, Guarnera, and Rufino (2013, p. 1891) that recruited forensic psychiatrists and psychologists, "offering 'gold standard' training (and continuing-education credits) on the PCL-R." These authors paid these expert assessors \$400 each to return later to score four offender files "selected to be representative of SVP cases generally" (p. 1891). They then randomly assigned the forensic experts "to either a prosecution-allegiance or a defense-allegiance group and were deceived to believe that they were a part of a formal, large-scale forensic consultation paid for by either a public-defender service or a specialized prosecution unit that prosecutes SVP cases" (p. 1891). The prosecution evaluators scored three of the four cases higher than did the defense evaluators, but the differences in scores were small (3.2, 3.3, 2.4, and 0), with a mean difference of 2.2. The authors concluded (p. 1889) that "the results provide strong evidence of an allegiance effect among some forensic experts in adversarial legal proceedings," (p. 1889), and that "the pull of adversarial proceedings tends to influence opinions by paid forensic experts" (p. 1895).

Of course, not all jurisdictions use an adversarial system, and among some of those that do, the adversarial effects are not nearly as strong as they are in U.S. SVP and capital cases. For example, Canada does not have the death penalty, nor does it civilly commit offenders after they have served their sentences. Instead, after a jury finds an offender guilty, the court can sentence an offender to preventive detention (indeterminate sentence) as a dangerous offender (DO), a determinate sentence as a long-term offender (LTO) with an extended postrelease period of supervision, or a determinate sentence. The use of the PCL-R in DO and LTO hearings is common, with testimony from prosecution and defense experts and, in some cases, by court-appointed experts. Lloyd, Clark, and Forth (2010) reported on the use of the PCL-R in 52 such cases over a 5-year period. The mean PCL-R scores assigned by the prosecution, defense, and court-appointed experts were 28.9 (SD = 6.6), 24.0 (SD = 5.1), and 27.0 (SD =5.1), respectively. The ICC (two-way mixed model, absolute agreement) between assessments for prosecution and defense evaluators was .67, with corresponding ICCs of .82 and .71 for defense versus court-appointed evaluators and prosecution versus court-appointed evaluators, respectively-values notably higher than those values reported for SVP evaluators. However, the number of evaluators for some comparisons was small.

Blais and Forth (2014) investigated 111 PCL-R assessments by 37 evaluators (30 psychiatrists,

seven psychologists) in Canadian preventive detention hearings (DO and LTO). Sixty-eight (61%) assessments were at the request of the court and 43 (39%) were at the request of the prosecution. The defense had requested seven assessments, with six PCL-R scores (M = 18.1) available to the authors, a sample too small for comparative analysis (J. Blais, personal communication to R. D. Hare, October 31, 2014). The mean PCL-R scores assigned by the prosecution-retained experts and the courtretained experts were 23.5 (SD = 8.1) and 22.3(SD = 8.0), respectively, a difference of only 1.2 points. In making decisions about the disposition of the offenders, the judges placed more weight on the PCL-R scores of the court-appointed than the prosecution-appointed experts, and only the PCL-R scores of the court-retained experts significantly predicted designation as a DO (AUC = .72).

Concerns about adversarial and allegiance effects are not specific to the PCL-R, or to evaluations of a psychological or psychiatric nature. Similar concerns apply to expert testimony about any variable or condition that can help or harm one side of a case or the other. Solutions to this problem are difficult to arrive at but must include providing better information to judges and lawyers, requiring higher professional and ethical training and standards of experts, and ensuring that testimony by experts is considered in an informed manner by court representatives (see Dror & Murrie, 2017). There is no justifiable reason why experienced clinicians cannot provide PCL-R scores that are as reliable as those obtained by researchers and their students.8 Standard protocols for appropriate use of the PCL-R and its derivatives (Brook et al., 2013; Forth et al., 2003, 2013; Gacono, 2016; Hare, 2003; Hare et al., 2013) are explicit in recommending that users document how and why they assigned a particular score to an individual, and that they be able to justify their scoring and interpretations. Even so, some clinicians may be unqualified or personally unsuited to conducting psychological evaluations that have serious consequences for an individual and society. Others function in an adversarial system in which allegiance to one side or the other may trump professional integrity. As noted earlier, Harris and colleagues (2013) argue that some studies of adversarial bias conflate standard PCL-R assessments with those based on fileonly reviews. Moreover, offenders with high scores on PCL-R Factor 1 may be more successful with some clinicians than with others at using positive impression management to lower their scores on the PCL-R, the HCR-20, and other risk scales (see Gillard & Rogers, 2015; Harris et al., 2013).

Probative and prejudicial issues concerning the use of the PCL-R in civil commitment and capital sentencing are beyond the scope of this chapter, but they are discussed in detail elsewhere (see DeMatteo et al., 2014; Häkkänen-Nyholm & Nyholm, 2012; Kiehl & Sinnott-Armstrong, 2013; Luna, 2013; Morse, 2013; Ogloff et al., 2016; Rice & Harris, 2013; also see Part VI, this volume).

# The PCL-R Four-Factor Model of Psychopathy

One of the strengths of the PCL scales is their clear and coherent internal structure. It has been well documented that the items that make up these scales (PCL-R, PCL:SV, PCL:YV, SRP, B-Scan) represent a set of four correlated latent trait domains (Interpersonal, Affective, Lifestyle, Antisocial) that characterize individuals with psychopathic personality. Over the past decade, sophisticated item-level latent variable analyses have provided strong support for this four-factor model of the PCL scales, adding to their construct validity (Neumann, Hare, Mokros, et al., 2015).

From a theoretical viewpoint, the items within the PCL-R and related scales reflect traits that provide important advantages for "capturing" psychopathic personality using variable- and personcentered approaches. Gordon Allport, one of the central figures in early personality research, recognized that "a trait is known not by its cause, but by what it causes; not by its roots but by its fruits" (p. 94 as cited in Deary, 2009). Cattell (as cited in Deary, 2009) noted that a trait resides not only in an organism but also in the relation between the organism and the environment. The PCL-R (Hare, 2003) and the latest version of the SRP inventory (Paulhus et al., 2016) contain items that describe characteristic maladaptive covert and overt dissocial traits and behaviors of psychopathic personality, which are integral components of the psychopathy construct (Forsman et al., 2010; Larsson et al., 2007; Neumann, Hare, & Pardini, 2015; in this volume, see Viding & Kimonis [Chapter 7], Waldman, Rhee, LoParo, & Park [Chapter 14], and Frick & Marsee [Chapter 19]).

Research on personality disorders and on psychopathy can benefit from delineation of the (characteristic) maladaptive manifestations of personality pathology (Hare et al., 2012; Miller, Lynam, Widiger, & Leukefeld, 2001; Wilson, Miller, Zeichner, Lynam, & Widiger, 2011; in this volume, see Lynam, Miller, & Derefinko [Chapter 11]).<sup>9</sup> In terms of current and future research, we see two complementary approaches that together may lead us to a deeper understanding of psychopathic personality. The road map for such work follows one of Allport's (1961) classic doctrines of traits (#8): "A trait may be viewed either in the light of the personality which contains it or in light of its distribution in the population at large" (p. 94, as cited in Deary, 2009). Allport's proposal is very much in line with our use of variablecentered and person-centered approaches to study psychopathy. With respect to the former, we have used, to good effect, the variable-centered approach of SEM to examine the underlying structure of psychopathic features in large diverse populations (Neumann & Pardini, 2014). SEM involves explication of the covariance of a set of variables (items, scales) collected across large groups of individuals. This approach advances our understanding of the distribution and covariation of traits in various populations.

Our person-centered approach involves the use of LPA of the four PCL-R factors (Interpersonal, Affective, Lifestyle, and Antisocial). More specifically, LPA, a variant of latent class analysis (LCA) used with continuous dependent variables, allows us to uncover different PCL-based trait profiles of individuals, which are then supported through replication with other samples and by validity analyses that demonstrate how different profile variants are linked with external correlates. Each approach, variable- and person-centered, provides insight into the psychopathy construct. In the subsections that follow, we summarize recent latent variable PCL research and provide new latent variable and person-centered analyses to help further advance theory and research on psychopathy using PCL measures.

#### Variable-Centered Evidence

In the past decade a considerable amount of (variable-centered) SEM research has been conducted on the PCL scales and related self-report instruments. In research with international colleagues, we have shown that a model specifying four correlated latent dimensions or factors (Interpersonal, Affective, Lifestyle, and Antisocial) shows good model fit, irrespective of sample type or method of assessment (Neumann, Hare, & Pardini, 2015). This four-factor model applies to samples of adult offenders (e.g., Neumann et al., 2007; Neumann, Hare, & Johansson, 2013), forensic psychiatric patients (e.g., Hill, Neumann, & Rogers, 2004; Jackson, Neumann, & Vitacco, 2007; Vitacco, Neumann, & Jackson, 2005; Zwets, Hornsveld, Neumann, Muris, & van Marle, 2015), and adolescent offenders (e.g., Kosson et al., 2013; Neumann et al., 2006). It also applies to community (Neumann & Hare, 2008; Neumann & Pardini, 2014) and corporate samples (Babiak, Neumann, & Hare, 2010; Mathieu et al., 2013). Fit for the model in the latter two samples (community and corporate) is in line with a wealth of studies that document psychopathy as a continuously distributed (dimensional) construct. In addition, multigroup CFA studies have provided generally good evidence for at least weak measurement invariance of the four-factor model item sets across studies and samples (Jackson et al., 2007; Kosson et al., 2013; Mokros et al., 2011; Mokros, Habermeyer, et al., 2014; Neumann et al., 2006; Neumann, Schmitt, Carter, Embley, & Hare, 2012).

PCL-based self-report instruments show similar results. In particular, studies focusing on the SRP scales (Paulhus et al., 2016) provide evidence for the four-factor model (Carré, Hyde, Neumann, Viding, & Hariri, 2013; Mahmut, Menictas, Stevenson, & Homewood, 2011; Neal & Sellbom, 2012; Neumann & Pardini, 2014; Seara-Cardoso, Neumann, Roiser, McCrory, & Viding, 2012; Welker, Lozoya, Campbell, Neumann, & Carré, 2014; Williams, Paulhus, & Hare, 2007). One such study using SRP data from a very large ("mega") sample representing 11 major regions of the world (N = 33,016) found that the four-factor model exhibited good fit (root mean square error of approximation [RMSEA] = .04, comparative fit index [CFI] = .94), and was invariant across males and female subsamples (Neumann et al., 2012). In ongoing research with the PCL-R and its derivatives, including the interview and file-based PCL:SV and PCL:YV and the self-report based SRP and B-Scan, Neumann and colleagues (2015) summarized model fit of the four-factor model for an additional 17 samples from several different countries (overall N = 19,941). The samples consisted of adult and adolescent offenders of both genders, male forensic psychiatric patients, and individuals from the general community and the corporate sector. The model for this aggregate sample combined with the previously noted "mega" sample (N = 52,957) showed good fit (RMSEA/ standardized root mean square residual [SRMR] = .06; CFI/Tucker-Lewis Index [TLI] = .94). Similar results have been obtained with samples from Bulgaria (Wilson, Abramowitz, Vasilev, Bozgunov, & Vassileva, 2014), Lithuania (Žukauskienė, Laurinavičius, & Čėsnienė, 2010), Finland (Jüriloo et al., 2014), and Germany (Köhler, Geiger, & Huchzermeier, 2013), among others.

In summary, regardless of sample type, method of assessment, or item content, there is consistent CFA support for the PCL four-factor model of psychopathy. As such, the SEM analyses of the PCL scales and related instruments (SRP, B-Scan) provide the field with a replicable four-factor dimensional structure with which to represent psychopathic personality. In addition to having a set of clearly articulated PCL-based dimensions in various samples (variable-centered perspective), the four PCL-based dimensions also provide a means for classifying psychopathic individuals (see "Person-Centered Evidence" below).

#### SEM Analyses of the PCL-R and SRP

Figure 3.2 (from Neumann, Hare, Mokros, et al., 2015) presents standardized parameters from an SEM analysis for the four-factor PCL-R model, based on data for a large combined sample (N = 12,301) of male offenders from North America (N = 6,929), Europe (N = 1,983), and the Netherlands (N = 3,389). Statistical model fit for the model in

this combined dataset was good (RMSEA = .06, CFI = .93,), indicating that the model accommodates data from different cultures.

As with the PCL-R "mega" sample, we found strong support for the four-factor model using the SRP-Short Form (SRP-SF). Our results were based on a large, diverse pooled sample of 1,730 adults described in the manual for the SRP (Paulhus et al., 2016), which included college students (N = 788), adults from the Eugene–Springfield (Oregon) Community Sample Study (N = 638; Goldberg & Paulhus, 2008), and adult male offenders (N = 304) from Wisconsin prisons. A model for the SRP delineating four factors paralleling those of the PCL-R exhibited acceptable fit in this diverse participant sample (TLI = .93, SRMR = .07).

Neumann, Hare, and Pardini (2015) directly evaluated the correspondence of factor structures for the PCL-R and the SRP-SF in two independent samples for which both measures were available: 304 male offenders from prisons in Wisconsin (WI) and 208 young adult males from the Pittsburgh Youth Study (PYS). Mean PCL-R



**FIGURE 3.2.** North American–European mega-sample of the PCL-R four-factor model of psychopathy (N = 12,301). Note the 90% CIs in parentheses. From Neumann, Hare, and Pardini (2015). Reprinted by permission.

and SRP-SF scores were, respectively, 22.1 (SD = 5.5) and 77.56 (SD = 17.3) for the WI sample, and 13.0 (SD = 9.4) and 62.8 (SD = 16.3) for the PYS sample. The authors conducted CFAs with each sample to evaluate the fit of four-factor PCL-R and SRP-SF models, and to examine the latent correlations among the PCL-R and SRP-SF dimensions. Model fit was good for both the WI offender sample (RMSEA = .04, CFI = .90) and the PYS community sample (RMSEA = .04, CFI = .94). The manifest (observed) variable correlations between the PCL-R and SRP-SF total scores for the WI and PYS samples, respectively, were r = .50 and .51, p's < .001. The majority of the (latent) correlations were highly consistent across the two samples, and the PCL-R/SRP associations generally were in the moderate to strong range. These results provide good evidence of construct generalizability across the two different assessment approaches to psychopathy, one based on clinical (PCL-R) ratings and the other on selfreport (SRP). Furthermore, in each sample, SRP total and factor scores were significantly higher among offenders with high PCL-R scores ( $\geq$  30 on the Wisconsin sample and  $\geq 25$  in the Pittsburgh sample) than among offenders with lower PCL-R scores. This is an important finding given that a valid self-report counterpart to the PCL-R should be able to discriminate between those with high and low PCL-R scores.<sup>10</sup>

Given its conceptual and empirical ties to the PCL-R, the SRP shows relations in expected theoretical directions with relevant external correlates. These include criminal offenses and externalizing psychopathology (Fite, Raine, Stouthamer-Loeber, Loeber, & Pardini, 2010; Nathanson, Paulhus, & Williams, 2006; Neumann & Pardini, 2014; Vitacco, Neumann, & Pardini, 2014; Wilson et al., 2011), moral reasoning (Seara-Cardoso et al., 2012; Seara-Cardoso, Dolberg, Neumann, Roiser, & Viding, 2013), amygdala activation to fearful faces (Carré et al., 2013), and amygdala volume (Pardini, Raine, Erickson, & Loeber, 2014). The SRP also shows theoretically meaningful associations with personality variables (Neal & Sellbom, 2012; Williams et al., 2007), as well as with measures of cognitive functioning (Mahmut, Homewood, & Stevenson, 2008), social information processing (Lockwood, Bird, Bridge, & Viding, 2013), and social reward (Foulkes, Seara-Cardoso, Neumann, Rogers, & Viding, 2014). Thus, like the PCL Scales, the SRP has good construct validity and may prove valuable as a research tool and as a supplement to the PCL scales.

#### PCL-R/SRP Model Parameters

As we have discussed in detail elsewhere, itemlevel factor loadings are discrimination parameters that allow investigators to parse how well various item ratings or responses can discriminate individuals on latent psychopathy traits (e.g., Hare & Neumann, 2006; Neumann et al., 2007, 2012; Neumann & Pardini, 2014). The PCL scales contain items with strong discrimination parameters that are able to differentiate individuals based on the PCL psychopathy factors (Interpersonal, Affective, Lifestyle, Antisocial). The average factor loadings for items of both the PCL-R and SRP in analyses for large aggregate samples described in the preceding subsection were approximately .70, indicating that both instruments contain items that differentiate individuals with higher versus lower psychopathic tendencies. Notably, the discrimination parameters for the Interpersonal and Affective items are on average slightly larger for the PCL-R (Interpersonal = .72, Affective = .73) than for the SRP (Interpersonal = .69, Affective = .65), suggesting that interview-plus-file based assessments are better than self-reports for gauging these features of psychopathy. On the other hand, the SRP performed somewhat better than the PCL-R at discriminating Antisocial features of psychopathy (.71 and .64, respectively). Furthermore, Antisocial items emerge as some of the best discriminating psychopathy items in community (Neumann & Hare, 2008), adolescent (Neumann et al., 2006), and college samples (Welker et al., 2014).

Item-level latent variable analyses of the PCL-R and its derivatives, including the SRP, indicate that these measures have sound internal validity. We know a great deal about how the items relate to one another, and their dimensionality and itemto-factor relations are well delineated (e.g., Hare & Neumann, 2008; Neumann, Hare, Mokros, et al., 2015; Neumann & Pardini, 2014; Paulhus et al., 2016; Welker et al., 2014). Analyses of this sort are important for interpreting the associations a scale shows with other measures of the construct it is intended to index (Smith, McCarthy, & Zapolski, 2009).

#### Correlates of the PCL-R Four-Factor Model

Because of space limitations, we only allude to some of the extant research on the correlates of the four PCL-R factors. These include gray-matter volume (Baskin-Sommers, Neumann, Cope, & Kiehl, 2016), endocrine functioning (Welker et al., 2014), fearlessness and low anxiety (Neumann et al., 2012), violence (Neumann & Hare, 2008; Vitacco et al., 2005), overt and instrumental aggression (Hill et al., 2004; Vitacco et al., 2005), externalizing psychopathology and criminal offenses (Neumann & Pardini, 2014; Olver, Neumann, Wong, & Hare, 2013; Vitacco, Neumann, & Caldwell, 2010; Vitacco et al., 2014), gender differences in intimate partner violence (Mager, Bresin, & Verona, 2014; also see Verona & Vitale, Chapter 21, this volume), and corporate misbehavior (Babiak et al., 2010; Mathieu, Neumann, Hare, & Babiak, 2014). In addition, neuroimaging investigators have begun to employ two- and four-factor models in their research (Cope et al., 2012; Cope, Ermer, et al., 2014; Cope, Vincent, et al., 2014; Craig et al., 2009; Glenn, Raine, & Schug, 2009; Neumann & Pardini, 2014; Yang et al., 2005). Similar applications of the SRP four-factor model are beginning to appear (Carré et al., 2013; Pardini et al., 2014).

Some writers have suggested that the predictive power of the PCL scales in the criminal justice system relies heavily or exclusively on their Lifestyle and Antisocial factors (Leistico, Salekin, DeCoster, & Rogers, 2008). In large part, this conclusion is based on zero-order or partial correlations between manifest psychopathy composite scores and specific outcome variables such as criminal recidivism, or on regression analyses using manifest psychopathy factor scores to predict such outcomes. However, alternative latent variable (SEM) analyses provide evidence that the Interpersonal factor (Hill et al., 2004; Neumann & Pardini, 2014; Vitacco et al., 2010) and the Affective factor (Neumann & Pardini, 2014; Olver et al., 2013; Vitacco et al., 2005) contribute significantly to prediction of clinical criteria, including treatment outcome, aggression, criminal recidivism, and other externalizing psychopathology. For example, in the MacArthur Risk Assessment Study (Steadman et al., 1998) on risk for violence in civil psychiatric patients, Skeem and Mulvey (2001) presented evidence that the PCL:SV was the strongest predictor (eta = .36) of self-reported violence at 20 weeks postdischarge, with the relationship stronger for Factor 2 (.38) than for Factor 1 (.28). The authors concluded that "the predictive power of the PCL:SV is not based on its assessment of the core traits of psychopathy, as traditionally construed" (p. 358). By core traits, they meant the Interpersonal/Affective items in Factor 1. In contrast with this manifest-variable analysis, an SEM analysis of the same data by Vitacco and colleagues (2005) demonstrated that the Affective (.41) and Antisocial factors (.40) were equally predictive of violence at the 20-week follow-up assessment (see Figure 3.3).



**FIGURE 3.3.** PCL:SV four-factor structural equation model for the prediction of violence and aggression at 20 weeks postrelease in the MacArthur Risk Assessment Study of civil psychiatric patients. From Vitacco et al. (2005, Fig. 3). Reprinted by permission.

#### Alternative PCL Structural Models

Cooke and Michie (2001) developed a three-factor model of the PCL-R as an alternative to the original two-factor model. Detailed critiques of this model are available elsewhere (e.g., Hare, 2003; Hare & Neumann, 2006; Neumann et al., 2007), and here we offer only a few comments. The decision by these authors to exclude antisocial items from their analyses was not justified on conceptual or empirical grounds. Furthermore, the threefactor model as originally presented included "testlets," which are essentially latent factors, and thus specified 10 latent factors to account for only 13 items of the PCL-R (and seven factors to account for nine items of the PCL:SV). However, subsequent work by our group indicated that the extra (testlet) factors were unnecessary, and that a four factor-model could subsume the three-factor model (Hill et al., 2004; Neumann, 2007; Neumann, Vitacco, Hare, & Wupperman, 2005; Neumann et al., 2006). From a mathematical modeling perspective, the three-factor model is less parsimonious than the four-factor model (i.e., requiring more parameters to account for less data), providing it with an advantage for achieving good overall model fit (see Neumann et al., 2005, for a detailed discussion of this topic).

Recently, Walters (2015) presented a two-factor model based on 10 items selected from the Interpersonal, Affective, and Lifestyle dimensions of the PCL-R. Curiously, he used the label 'Fearlessness' for the first factor, which comprised three items from the PCL-R's Interpersonal facet (Glib/superficial, Pathological lying, and Conning/manipulative) along with three items from its Affective facet (Lack of remorse, Shallow affect, and Callous/lacks empathy). Reference to this set of items as Fearlessness, presumably to make it appear that parts of the PCL-R were in line with the TriPM dimension of Boldness and the PPI dimension of Fearless Dominance (FD), is questionable, however. There are theoretical and empirical reasons to doubt that the FD factor is a core part of the psychopathy construct, at least as measured by the PCL-R and its derivatives (Copestake, Gray, & Snowden, 2011; Lynam & Miller, 2012; Miller & Lynam, 2012).11 The second factor reported by Walters, labeled Disinhibition (Stimulation seeking, Unrealistic goals, Impulsivity, and Irresponsible), is less of a problem, though it does exclude a core aspect of psychopathy (i.e., overt antisociality).

In other work, Patrick and colleagues (2007) described a *bifactor model* of the PCL-R as an alternative to the correlated factors, superordinate model. Like the correlated factors model, the bifactor model "still assumes a general factor underlying all variables and a specific or unique factor for each, but in addition it includes a number of uncorrelated group factors consisting of two or more variables. . . . Thus, the bifactor, or nested factor, approach differs from the higher-order model approach in that the group variables are not subsumed by the general factor but are uncorrelated and distinct" (p. 124). Bifactor modeling recently has become common (Millsap & Olivera-Aguilar, 2012), though not without conceptual and practical concerns (Bonifay, Lane, & Reise, 2017). This model essentially bifurcates the variances of the items across the general and group (or subsidiary) factors. This often results in low item discrimination parameters for the group factors. It is essential to specify the group factors as orthogonal to the general factor for adequate model identification, which some investigators value because the group factors are then uncorrelated with the general factor. For this model, it is relatively easy to achieve good fit because there is a large number of estimated model parameters to account for the data (e.g., the four-factor model uses 42 estimated parameters to account for 171 variances/covariances, while the bifactor model requires 72 estimated parameters for the same covariance matrix).

With respect to the bifactor model of the PCL-R, or any other bifactor model, an important theoretical question arises: What is the exact meaning of the group (specific) factors, given their specification as orthogonal to the general factor presumed to reflect psychopathy as a whole? That is, if the general factor on which the PCL-R items as a whole load represents the combination of interpersonal, affective, lifestyle, and antisocial features associated with psychopathy, then what, for example, is the meaning of the orthogonal group factor involving just the interpersonal features (items 1, 2, 4, and 5)? Clearly, they cannot refer to the same thing, so one would have to propose that psychopathy entails certain interpersonal features that are uncorrelated with other interpersonal features, certain affective features that are uncorrelated with other affective features, and so forth. These considerations also apply to the bifactor model of the SRP described by Debowska, Boduszek, Kola, and Hyland (2014). In addition, there remains the practical problem of how to compute manifest variable scores for individuals assessed with the PCL-R, with the group factor composites being orthogonal to a general factor composite. On the other hand, bifactor models of the PCL-R support the practice of summing all item ratings into a single total score, thereby providing a psychometric yardstick much akin to theta in IRT analyses.

In summary, the evidence is extensive for a correlated four-factor model of PCL-R psychopathy based on a vast large array of studies using diverse sample types and assessment approaches; the model generalizes beyond specific items. Thus, it is reasonable to use the clearly articulated PCLbased factors as the basis for classifying individuals according to profiles of scores on these factors.

## **Person-Centered Evidence: LPA**

SEM research on the distribution (and covariation) of PCL-based traits in a given sample allows investigators to study the structure of these traits (e.g., four-factor model), and the associations of the trait domains (latent variables) with various external correlates (e.g., amygdala activation, ratings of fearlessness, violence) across large and diverse samples of individuals. However, variablebased SEM research does not provide information at the level of specific individuals, nor does it address the possibility that there may be subgroups or variants of individuals who exhibit differing expressions of psychopathic features.

Hicks and Drislane (Chapter 13, this volume) provide detailed coverage of historic conceptions of psychopathy variants and of findings from empirical studies. We limit coverage here to recent research by our group, focusing on variants or subtypes as defined by profiles of scores on the four PCL-R factors.

#### LPA of High PCL-R Scorers

Recently, Mokros and colleagues (2015) conducted LPAs of the four PCL-based factors of male offenders with high PCL-R scores. LPA is a probabilistic or model-based alternative to conventional cluster analysis used for identifying homogeneous subgroups within a sample through maximum likelihood (ML) estimation (for further details, see Vermunt & Magidson, 2006). The sample for this LPA study (N = 1,451) consisted of participants from the North American reference sample of 5,408 offenders described by Hare (2003, p. 55) with a PCL-R score of 27 or higher. A solution with three latent classes, similar in terms of overall PCL-R scores, emerged (see Figure 3.4, top panel). Tentative labels assigned to the latent classes were Manipulative psychopaths (LC1), Aggressive psychopaths (LC2), and Sociopathic offenders (LC3). Several investigators have searched for latent classes in samples of offenders selected based on a PCL-R threshold higher than 27 (e.g., 29 by Skeem, Johansson, Andershed, Kerr, & Louden, 2007; 30 by Hicks, Markon, Patrick, Krueger, & Newman, 2004). For comparison purposes Mokros and colleagues (2015; Supplemental Material) performed an LPA on offenders with a PCL-R score of at least 30 (the upper 15% of the Reference Group; N =856). A two-group solution provided sufficient fit to the data. The two latent classes were virtually identical to the LC1 (Manipulative) and LC2 (Aggressive) classes depicted in Figure 3.4.

Mokros and colleagues (2015) replicated the finding of three distinct classes in an independent sample of 497 male offenders with a PCL-R score of 27 or higher (Figure 3.4, bottom panel), for which external criterion variables of various kinds were available. The three latent classes differed in meaningful ways on several of these criterion variables, with LC1 exhibiting higher education and intelligence, and lower aggression and antisociality than the other latent classes, and LC3 scoring highest in negative affect.

Mokros and colleagues (2015) suggested that LC1 and LC2 represent phenotypic variants of psychopathy corresponding, respectively, to Karpman's passive/parasitic and aggressive/predatory psychopathy, Arieti's (1963) complex and simple psychopathy, Book and Quinsey's (2003) cheater and warrior-hawk psychopathy, and the emotionally stable and aggressive psychopaths described by Hicks and colleagues (2004; see also Drislane et al., 2014). LC3, on the other hand, appears to consist of individuals who exhibit many psychopathic features but have a capacity for affect, guilt, and remorse at least on a par with the average offender.

#### LPA of Full PCL-R Distribution

Other work by our group has used LPA to characterize subgroups of scorers within full samples of offenders assessed using the PCL-R, as opposed to focusing only on high scorers. One such analysis used PCL-R scores for the entire North American (NA) reference sample of male offenders described by Hare (2003, p. 55) and in the preceding section. A four-class model provided the best solution (see Figure 3.5, top panel). The score profiles for this solution reflect: a *psychopath* group (C1), exhibiting elevations on all four PCL-R factors; a *callous*-



**FIGURE 3.4.** Mean item scores for each latent class on each PCL-R factor. The latent classes consist of offenders with a PCL-R score of 27 or higher. The mean item scores for the entire sample of 5,408 male offenders (Hare, 2003, p. 59) are around 1.00. From Mokros et al. (2015). Adapted by permission.

deceptive group (C2), exhibiting elevations mainly on the Interpersonal and Affective factors; a sociopathic offender group (C3), showing elevations on the Lifestyle and Antisocial factors; and a general offender group (C4), scoring comparatively low on all PCL-R factors. Mean PCL-R total scores for these four groups were 28.4, 16.8, 19.6, and 8.9, respectively.

A highly similar four-class solution (see Figure 3.5, bottom panel) also was obtained in a replication sample of 973 Swedish violent offenders (described in Neumann, Hare, & Johansson, 2013); the mean PCL-R total scores for these four classes (C1–C4) were 31.1, 17.4, 21.6, and 7.4, respectively. Several criterion variables were available for this sample, including (1) clinical ratings (0, 1, 2) of fearlessness and low anxiety as described by Neumann, Hare, and Johansson (2013); (2) ratings (0, 1, 2) of *behavioral activation system* (BAS) overactivity, reflecting high reward-seeking tendencies on the part of the offender (see Carver & White, 1994); and (3) scores on the Historical (H), Clinical (C), and Risk Management (R) scales of the HCR-20, which index static risk factors, present clinical status, and issues relevant to risk management, respectively.



**FIGURE 3.5.** Mean item scores for each latent class on each PCL-R factor. Top panel: Profiles are for an entire distribution of PCL-R scores of the development sample of 4,865 male offenders (Hare, 2003). Bottom panel: Profiles are for an entire distribution (N = 973) of Swedish violent offenders (Neumann, Hare, et al., 2013). From Neumann, Vitacco, and Mokros (2016). Adapted by permission.

Figure 3.6 (top panel) shows the proportion of offenders within each of the four classes from Figure 3.5 attaining a maximum score of 2 on each of the clinical rating items. The C1 (psychopathic) class included a significantly larger proportion of cases assigned ratings of 2 for fearlessness and low anxiety than did classes C2 and C3, which in turn exceeded class C4 in ratings of 2 for these measures. Group C2 (callous–deceptive) contained more cases with ratings of 2 for low anxiety than did group C3 (sociopathic), whereas C3 included more cases with ratings of 2 for fearlessness. The C1 and C3 groups, which scored similarly high

on the PCL-R Lifestyle and Antisocial factors, contained the largest proportion of cases rated 2 for overactive BAS—in line with the idea that high scores on Factor 2 of the PCL-R are associated with excessive reward seeking (Newman, MacCoon, Vaughn, & Sadeh, 2005; Newman & Malterer, 2009; Wallace, Malterer, & Newman, 2009). Clinical ratings of Behavioral Inhibition Scale (BIS) activity were not available, but if clinical ratings of fear and anxiety can be considered indicators of BIS, we might tentatively conclude (in accordance with the previously referenced research by Newman and colleagues [2005]) that the



**FIGURE 3.6.** Analyses of an entire distribution (N = 973) of Swedish violent offenders. Top panel: Proportion of cases in each profile with a threshold rating of 2 on Fearlessness, Low Anxiety, and Overactive Behavioral Activation System (BAS). Bottom panel: Mean scores on the HCR-20 by latent class profile.

offenders in C1 have low BIS and high BAS. As regards scores on the HCR-20, which are known to correlate highly with the PCL-R (> .70; Hare, 2003), group C1 exceeded the other groups in total scores (M's for groups C1-C4 = 30.8, 15.9, 24.1, and 10.5, respectively) and in scores for each HCR-20 subscale (see Figure 3.6, bottom panel). The elevated HCR-20 total score for group C3 relative to groups C2 and C4 was attributable mainly to high levels of historical risk factors. Clearly, across all LPA full-sample results, the C1 cases, elevated on all four PCL-R factors, represent the highest risk for violence, as assessed by the HCR-20. Finally, it is notable that the same four-class solution and pattern of PCL-R profiles emerged in recent LPA research applied to a large sample of male sex offenders (Kristic, Neumann, Roy, Robertson, & Hare, 2017).

#### Conclusions

Theory and research on psychopathy are increasing at an enormous rate. Much of this research involves the PCL-R and its derivatives, which measure the traditional clinical construct of psychopathy. These instruments are widely used for basic and applied investigations of psychopathy, its nature, and implications for society. Our purpose in this chapter was to provide a general outline of the development of the PCL scales, describe their psychometric and structural properties, discuss some issues concerning their use and misuse, and suggest new avenues of research.

In terms of new directions, a major focus was on variable- and person-centered applications of the four-factor model of psychopathy. In particular, latent class profiles uncovered with LPA may help us to understand differing expressions of psychopathic personality and the roles played by psychopathy in a wide array of disciplines and contexts important to society.

We still have much to learn about psychopathy, and contentious issues remain, as they do in all scientific endeavors. Among them is the extent to which various measures of psychopathy belong in the same nomological network, an issue discussed in this chapter and in detail throughout this volume. Some measures of psychopathy involve clinical ratings, while others depend on self-reports, in some cases based on conceptualizations of psychopathy derived from general personality theory. With the possible exception of the PCL-R/SRP, the associations between psychopathy assessments in clinical and self-report domains typically are not strong enough to assume that they measure the same construct. It is possible that clinical ratings and models based on self-reports provide different perspectives on the same construct, and that their joint use may help us better to understand psychopathy. It also is possible that they represent conceptualizations of different constructs, albeit using the same name (the "jingle fallacy"; cf. Malterer, Lilienfeld, Neumann, & Newman, 2010, p. 11). In any case, it is important that clinicians and researchers understand the manner in which the instruments they use relate to other putative measures of psychopathy and to the traditional clinical meaning of the term.

In our view, the behavioral features that define psychopathy provide a solid clinical framework for discussing the construct, but the mechanisms behind these features remain subjects of ongoing debate and research. The integration of clinical experience with new developments in measurement, behavioral genetics, developmental processes, neuroscience, and so forth, should inform our understanding of the construct.

#### ACKNOWLEDGMENTS

Grants from the Donner Foundation to Robert Hare and Craig Neumann facilitated preparation of this chapter. We appreciate the contributions made by our many colleagues, students, and research assistants over the years. Robert Hare receives royalties from the sale of the PCL-R and its derivatives. Craig Neumann receives royalties from the sale of the SRP-4. Andreas Mokros receives royalties from the sale of the German translation of the PCL-R. Craig Neumann dedicates his contributions to this chapter to the memory of his mother, Carole. We thank Kylie Neufeld for her extensive help in preparing this chapter.

#### NOTES

- 1. Several scales directly related to the PCL-R are the Business Scan 360 (B-Scan 360; Mathieu, Babiak, & Hare, in press; Mathieu, Hare, Jones, Babiak, & Neumann, 2013; Mathieu, Neumann, Babiak, & Hare, 2015) and the Self-Report Psychopathy-4 (SRP-4; Paulhus, Neumann, Hare, Williams, & Hemphill, 2016) scale. Each has the same fourfactor structure as the PCL scales. The B-Scan assesses psychopathy-related traits, behaviors among individuals within business-oriented or organizational settings, and comprises items related to work behaviors, written in business-friendly nonclinical language designed to engage those with a corporate mindset. We briefly refer to them throughout this chapter. Other scales include the Antisocial Process Screening Device (APSD; Frick & Hare, 2001), a measure based on the PCL-R that is designed to assess Callous-Unemotional traits, Narcissism, and Impulsivity in children (see Frick & Marsee, Chapter 19, this volume), and the Child Psychopathy Scale (CPS; Lynam, 1997), "a downward developmental translation" of the PCL-R (Lynam, Derefinko, Caspi, Loeber, & Stouthamer-Loeber, 2007, p. 363).
- 2. In his 2015 Presidential Address to the Society for the Scientific Study of Psychopathy, Scott Lilienfeld referred to the work by Harpur et al. (1989) as the most important psychopathy article in the past quarter century. It showed that psychopathy is a multidimensional construct, with correlates that are different for each factor.
- 3. Haycock (2014, p. 43) quoted a statement made by Adrian Raine at the 2013 meeting of the Society for Scientific Study of Psychopathy (SSSP) in Washington, D.C. "My perspective is . . . it's not 24-karat gold but it's 18-karat gold. And for better or worse, we still have the '800-pound gorilla' to contend with."
- Item descriptions and scoring instructions are available on request from P. Johansson (petert.johansson@kriminalvarden.se) or H. Andershed (henrik.andershed@oru.se).
- Discussions concerning the triarchic model and DSM-5 are examined by Crego and Widiger (2016), Widiger & Crego (Chapter 12, this volume), and Patrick (Chapter 1, this volume).
- 6. Blais, Forth, and Hare (2017) reported that the ICC (two-way random effects, absolute agreement, single measure) for 280 raters who scored six videotaped case histories as part of the Darkstone Post-Workshop Program was .75, .65, and .78 for PCL-R total scores, Factor 1 scores, and Factor 2 scores, respectively. These authors noted that scor-

ing standardized videotaped case studies does not allow the rater to interact directly with the offender. Real-world PCL-R assessments typically involve a face-to-face interview and much more extensive collateral information.

- 7. In an episode of the radio program "This American Life" titled The Psychopath Test, aired on June 27, 2011, a reporter stated that in 2014, a California lifer "will have a new parole hearing. If he goes to that hearing with his current score on the psychopath test, which he is slated to do, it's very likely that [he] will be denied." This is based on the erroneous assumption that a PCL-R score is fixed for life and that changes in behavior over time cannot result in a change in the score previously assigned to some items. However, the PCL-R manual (Hare, 2003, p. 20) states that some item scores can change if there are "persistent and convincing changes in behavior over the last 5 or 6 years" (emphasis in original). Furthermore, PCL-R total and Factor 2 scores, but not Factor 1 scores, are age-related, being lower in older than in younger offenders (Hare, 2003, pp. 61-62). Vachon and colleagues (2013) replicated this effect using FFM-based psychopathy scores.
- 8. McCahey and Proman (2011) wrote that Federal Rule of Evidence 706 "provides a means to slice through the fog of conflicting expert testimony and obtain unbiased testimony from a court-appointed expert" and that "use of Rule 706 court-appointed experts, or the threat thereof, may be increasingly useful to help keep expert 'hired guns' honest or, at the least, more restrained in their opinions."
- From the perspective of evolutionary psychology (Glenn et al., 2011; Lalumière et al., 2008; Mealey, 1995b), psychopathic behavior may be maladaptive to society but adaptive to the individual exhibiting such behavior.
- 10. Apparently, not all self-report measures are capable of discriminating PCL-R-defined groups. For example, Neumann, Uzieblo, and colleagues (2013) reported that the PPI/PPI-R did not substantially differentiate high PCL-R offenders, or even general offenders, from community samples that were similar to the offenders in age and IQ and without evidence of psychopathology.
- 11. Lilienfeld and colleagues (2016) reported that boldness correlates with measures of psychopathy *not based* on the PCL-R. They suggested that the PCL-R captures the "less successful" face of psychopathy, whereas other measures capture the "more successful" face of the construct (p. 1182). Of course, this depends on what "successful" means. Certainly, the senior executives with high PCL-R scores described by Babiak and colleagues (2010) were not "less successful" in attaining positions of power and influence, in spite of poor job performance ratings. The problem here is that we may end up with two competing (perhaps overlapping) conceptions of psychopathy, one based on clinical/

forensic assessments of the "real thing," and the other based on correlations among various selfreports of similar sets of items derived from college students and the general community. Rather than two faces of psychopathy, we may end up with two different conceptions of the construct that, like ASPD and psychopathy, are somewhat similar but conceptually and empirically different. Hare is concerned that this has the potential of sowing confusion among academic and clinical conceptions of psychopathy, with results that negatively affect the field. In other words, are we moving "back to the past" (Hare, 1985)?

#### REFERENCES

- Allport, G. W. (1961). Pattern and growth in personality. New York: Holt, Rinehart & Winston.
- American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (2014). *Standards for educational and psychological testing* (6th ed.). Washington, DC: Authors.
- American Psychiatric Association. (1980). Diagnostic and statistical manual of mental disorders (3rd ed.). Washington, DC: Author.
- American Psychiatric Association. (1987). Diagnostic and statistical manual of mental disorders (3rd ed., rev.). Washington, DC: Author.
- American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: Author.
- American Psychiatric Association. (2000). *Diagnostic* and statistical manual of mental disorders (4th ed., text rev.). Washington, DC: Author.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: Author.
- Andershed, H., Douglas, K., & Skeem, J. (2004). Clinical low anxiety, fearlessness item ratings (Version 1.0). Örebro, Sweden: Department of Behavioral, Social, and Legal Sciences, Örebro University.
- Anderson, J. L., & Kiehl, K. A. (2013). Functional neuroimaging and psychopathy. In K. A. Kiehl & W. P. Sinnott-Armstrong (Eds.), Handbook on psychopathy and law (pp. 131–149). New York: Oxford University Press.
- Anderson, J. L., Sellbom, M., Wygant, D. B., Salekin, R. T., & Krueger, R. F. (2014). Examining the associations between DSM-5 Section III antisocial personality disorder traits and psychopathy in community and university samples. *Journal of Personality Disorders*, 28, 675–697.
- Andrews, D., Bonta, J., & Wormith, J. (2004). Manual for the Level of Service/Case Management Inventory (LS/CMI). Toronto: Multi-Health Systems.
- Arieti, S. (1963). Psychopathic personality: Some views on its psychopathology and psychodynamics. Comprehensive Psychiatry, 4, 301–312.

- Babiak, P., Neumann, C. S., & Hare, R. D. (2010). Corporate psychopathy: Talking the walk. Behavioral Sciences and the Law, 28, 174–193.
- Baskin-Sommers, A. R., Neumann, C. S., Cope, L., & Kiehl, K. A. (2016). Latent variable modeling of brain gray matter volume and psychopathy in incarcerated offenders. *Journal of Abnormal Psychology*, 125, 811–817.
- Benning, S. D., Patrick, C. J., Salekin, R. T., & Leistico, A. M. R. (2005). Convergent and discriminant validity of psychopathy factors assessed via self-report: A comparison of three instruments. Assessment, 12, 270–289.
- Berrios, G. E. (1996). The history of mental symptoms: Descriptive psychopathology since the nineteenth century. Cambridge, UK: Cambridge University Press.
- Blair, R. J. R. (2005). Applying a cognitive neuroscience perspective to the disorder of psychopathy. *Development and Psychopathology*, 17, 865–891.
- Blair, R. J. R. (2013). The neurobiology of psychopathic traits in youths. Nature Reviews Neuroscience, 14, 786–799.
- Blais, J., & Forth, A. E. (2014). Prosecution-retained versus court-appointed experts: Comparing and contrasting risk assessment reports in preventative detention hearings. Law and Human Behavior, 38, 531–543.
- Blais, J., Forth, A. E., & Hare, R. D. (2017). Examining the interrater reliability of the Hare Psychopathy Checklist—Revised across a large sample of trained raters. *Psychological Assessment*, 29, 762–775.
- Blashfield, R. K., & Intoccia, V. (2000). Growth of the literature on the topic of personality disorders. American Journal of Psychiatry, 157, 447–472.
- Blashfield, R. K., & Reynolds, S. M. (2012). An invisible college view of the DSM-5 personality disorder classification. *Journal of Personality Disorders*, 26, 821–829.
- Boccaccini, M. T., Chevalier, C. S., Murrie, D. C., & Varela, J. G. (2015). Psychopathy Checklist—Revised use and reporting practices in sexually violent predator evaluations. *Sexual Abuse*, 29, 592–614.
- Boccaccini, M. T., Murrie, D. C., Rufino, K. A., & Gardner, B. O. (2014). Evaluator differences in Psychopathy Checklist—Revised factor and facet scores. *Law and Human Behavior*, 38, 337–345.
- Boccardi, M. (2013). Structural brain abnormalities and psychopathy. In K. A. Kiehl & W. P. Sinnott-Armstrong (Eds.), *Handbook on psychopathy and law* (pp. 150–160). New York: Oxford University Press.
- Bolt, D. M., Hare, R. D., & Neumann, C. S. (2007). Score metric equivalence of the Psychopathy Checklist—Revised (PCL-R) across criminal offenders in North America and the United Kingdom: A critique of Cooke, Michie, Hart, and Clark (2005) and new analyses. Assessment, 14, 44–56.
- Bolt, D., Hare, R. D., Vitale, J., & Newman, J. P. (2004). A multigroup item response theory analysis of the Hare Psychopathy Checklist—Revised. Psychological Assessment, 16, 155–168.
- Bonifay, W., Lane, S. P., & Reise, S. P. (2017). Three

concerns with applying a bifactor model as a structure of psychopathology. *Clinical Psychological Science*, 5, 184–186.

- Book, A. S., Forth, A. E., & Clark, H. J. (2013). The Hare Psychopathy Checklist: Youth Version. In R. P. Archer & E. M. Archer (Eds.), Forensic uses of clinical assessment instruments (2nd ed., pp. 266–290). New York: Routledge.
- Book, A. S., & Quinsey, V. L. (2003). Psychopaths: Cheaters or warrior-hawks? Personality and Individual Differences, 36, 33–45.
- Brenner, H., & Gefeller, O. (1997). Variation of sensitivity, specificity, likelihood ratios and predictive values with disease prevalence. *Statistics in Medicine*, 16, 981–991.
- Brook, M., Brieman, C. L., & Kosson, D. S. (2013). Emotion processing in Psychopathy Checklist-assessed psychopathy: A review of the literature. *Clinical Psychology Review*, 33, 979–995.
- Brown, S. L., & Forth, A. E. (1997). Psychopathy and sexual assault: Static risk factors, dynamic precursors, and rapist subtypes. *Journal of Consulting and Clinical Psychology*, 65, 848–857.
- Buss, A. H. (1966). Psychopathology. New York: Wiley.
- Carré, J., Hyde, L., Neumann, C. S., Viding, E., & Hariri, A. (2013). The neural signatures of distinct psychopathic traits. *Social Neuroscience*, 8, 122–135.
- Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS Scales. *Journal of Personality and Social Psychology*, 67, 319–333.
- Chevalier, C., Boccaccini, M. T., Murrie, D. C., & Varela, J. G. (2015). Static-99R reporting practices in sexually violent predator cases: Does norm selection reflect adversarial allegiance? *Law and Human Behavior*, 39, 209–218.
- Cleckley, H. (1976). *The mask of sanity* (5th ed.). St. Louis, MO: Mosby. (Original work published 1941)
- Cooke, D. J., & Michie, C. (1999). Psychopathy across cultures: North America and Scotland compared. *Journal of Abnormal Psychology*, 108, 55–68.
- Cooke, D. J., & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment*, 13, 171–188.
- Cooke, D. J., Michie, C., Hart, S. D., & Clark, D. (2005a). Assessing psychopathy in the UK: Concerns about cross-cultural generalizability. *British Journal of Psychiatry*, 186, 335–341.
- Cooke, D. J., Michie, C., Hart, S. D., & Clark, D. (2005b). Searching for the pan-cultural core of psychopathic personality disorder. *Personality and Indi*vidual Differences, 39, 283–295.
- Cooke, D. J., Michie, C., Hart, S. D., & Hare, R. D. (1999). Evaluating the Screening Version of the Hare Psychopathy Checklist—Revised (PCL:SV): An item response theory analysis. *Psychological Assessment*, 11, 3–13.
- Cope, L. M., Ermer, E., Nyalakanti, P. K., Calhoun, V.

D., & Kiehl, K. A. (2014). Paralimbic gray matter reductions in incarcerated adolescent females with psychopathic traits. *Journal of Abnormal Child Psychology*, 42, 659–668.

- Cope, L. M., Shane, M. S., Segall, J. M., Nyalakanti, P. K., Stevens, M. C., Pearlson, G. D., et al. (2012). Examining the effect of psychopathic traits on gray matter volume in a community substance abuse sample. *Psychiatry Research*, 204, 91–100.
- Cope, L. M., Vincent, G. M., Jobelius, J. L., Nyalakanti, P. K., Calhoun, V. D., & Kiehl, K. A. (2014, February). Psychopathic traits modulate brain responses to drug cues in incarcerated offenders. *Frontiers in Human Neuroscience*, 8, Article No. 87.
- Copestake, S., Gray, N. S., & Snowden, R. J. (2011). A comparison of a self-report measure of psychopathy with the Psychopathy Checklist—Revised in a UK sample of offenders. *Journal of Forensic Psychiatry and Psychology*, 22, 169–182.
- Craig, M. C., Catani, M., Deeley, Q., Latham, R., Daly, E., Kanaan, R., et al. (2009). Altered connections on the road to psychopathy. *Molecular Psychiatry*, 14, 946–953.
- Crego, C., & Widiger, T. A. (2015). Psychopathy and the DSM. Journal of Personality, 83, 665–677.
- Dåderman, A. M., & Hellström, A. (2018). Interrater reliability of Pyschopathy Checklist–Revised: Results on multiple analysis levels for a sample of patients undergoing forensic psychiatric evaluations. Criminal Justice and Behavior, 45, 234–262.
- Damasio, A. R. (1995). Descartes' error: Emotion, reason, and the human brain. New York: Penguin Books.
- Deary, I. J. (2009). The trait approach to personality. In P. J. Corr & G. Mathews (Eds.), *The Cambridge handbook of personality psychology* (pp. 89–109). New York: Cambridge University Press.
- Debowska, A., Boduszek, D., Kola, S., & Hyland, P. (2014). A bifactor model of the Polish version of the Hare Self-Report Psychopathy Scale. *Personality and Individual Differences*, 69, 231–237.
- DeMatteo, D., Edens, J. F., Galloway, M., Cox, J., Smith, S. T., Koller, J. P., et al. (2014). Investigating the role of the Psychopathy Checklist—Revised in United States case law. Psychology, Public Policy, and Law, 20, 96–107.
- Derefinko, K. J. (2015). Psychopathy and low anxiety: Meta-analytic evidence for the absence of inhibition, not affect. Journal of Personality, 83, 693–709.
- Dolan, M. C., & Rennie, C. E. (2006). Reliability and validity of the Psychopathy Checklist: Youth Version in a UK sample of conduct disordered boys. *Personality and Individual Differences*, 40, 65–75.
- Douglas, K. S., Strand, S., Belfrage, H., Fransson, G., & Levander, S. (2005). Reliability and validity evaluation of the Psychopathy Checklist: Screening Version (PCL:SV) in Swedish correctional and forensic psychiatric samples. Assessment, 12, 145–161.
- Drislane, L. E., Patrick, C. J., Sourander, A., Sillanmäki, L., Aggen, S. H., Elonheimo, H., et al. (2014). Distinct variants of extreme psychopathic individuals

in society at large: Evidence from a population-based sample. *Personality Disorders*, *5*, 154–163.

- Dror, I. E., & Murrie, D. C. (2017). A hierarchy of expert performance applied to forensic psychological assessments. *Psychology*, *Public Policy*, and Law. [Epub ahead of print]
- Edens, J. F. (2006). Unresolved controversies concerning psychopathy: Implications for clinical and forensic decision making. *Professional Psychology: Research* and Practice, 37, 59–65.
- Edens, J. F., Marcus, D. K., Lilienfeld, S. O., & Poythress, N. G. (2006). Psychopathic, not psychopath: Taxometric evidence for the dimensional structure of psychopathy. *Journal of Abnormal Psychology*, 115, 131–144.
- Ermer, E., Cope, L. M., Nyalakanti, P. K., Calhoun, V. D., & Kiehl, K. A. (2012). Aberrant paralimbic gray matter in criminal psychopathy. *Journal of Abnormal Psychology*, 121, 649–658.
- Evans, L., & Tully, R. J. (2016). The Triarchic Psychopathy Measure (TriPM): Alternative to the PCL-R? Aggression and Violent Behavior 27, 79–86.
- Felthous, A. R., & H. Sass, H. (Eds.). (in press). International handbook on psychopathic disorders and the law (2nd ed.). New York: Wiley.
- Few, L. R., Lynam, D. R., Maples, J. L., MacKillop, J., & Miller, J. D. (2014). Comparing the utility of DSM-5 Section II and III Antisocial Personality Disorder diagnostic approaches for capturing psychopathic traits. Personality Disorders: Theory, Research, and Treatment, 6, 64–74.
- Fite, P. J., Raine, A., Stouthamer-Loeber, M., Loeber, R., & Pardini, D. A. (2010). Reactive and proactive aggression in adolescent males: Examining differential outcomes 10 years later in early adulthood. *Criminal Justice and Behavior*, 37, 141–157.
- Forsman, M., Lichtenstein, P., Andershed, H., & Larsson, H. (2010). A longitudinal twin study of the direction of effects between psychopathic personality and antisocial behaviour. *Journal of Child Psychology and Psychiatry*, 51, 39–47.
- Forth, A. E., Bergstrom, H., & Clark, H. J. (2016). Psychopathic traits in adolescence: Assessment and implications. In C. B. Gacono (Ed.), *The clinical and forensic assessment of psychopathy: A practitioner's guide* (2nd ed., pp. 115–136). New York: Routledge.
- Forth, A. E., Bo, S., & Kongerslev, M. (2013). Assessment of psychopathy: The Hare Psychopathy Checklist measures. In K. Kiehl & W. Sinnott-Armstrong (Eds.), Handbook on psychopathy and law (pp. 5–33). New York: Oxford University Press.
- Forth, A. E., Kosson, D. S., & Hare, R. D. (2003). The Psychopathy Checklist: Youth Version manual. Toronto: Multi-Health Systems.
- Foulkes, L., Seara-Cardoso, A., Neumann, C. S., Rogers, J. S. C., & Viding, E. (2014). Looking after number one: Associations between psychopathic traits and measures of social motivation and functioning in a community sample of males. *Journal of Psychopathology and Behavioral Assessment*, 36, 22–29.

- Frick, P. J., & Hare, R. D. (2001). The Antisocial Process Screening Device. Toronto: Multi-Health Systems.
- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014). Can callous–unemotional traits enhance the understanding, diagnosis, and treatment of serious conduct problems in children and adolescents?: A comprehensive review. *Psychological Bulletin, 140*, 1–57.
- Gacono, C. B. (Ed.). (2000). The clinical and forensic assessment of psychopathy: A practitioner's guide. Mahwah, NJ: Erlbaum.
- Gacono, C. B. (Ed.). (2016). The clinical and forensic assessment of psychopathy: A practitioner's guide (2nd ed.). New York: Routledge.
- Gillard, N. D., & Rogers, R. (2015). Denial of risk: The effects of positive impression management on risk assessments for psychopathic and nonpsychopathic offenders. *International Journal of Law and Psychiatry*, 42–43, 106–113.
- Glenn, A. L., Kurzban, R., & Raine, A. (2011). Evolutionary theory and psychopathy. Aggression and Violent Behavior, 16, 371–380.
- Glenn, A., & Raine, A. (2014). Psychopathy: An introduction to biological findings and their implication. New York: New York University Press.
- Glenn, A. L., Raine, A., & Schug, R. A. (2009). The neural correlates of moral decision-making in psychopathy. *Molecular Psychiatry*, 14, 5–6.
- Goldberg, L. R., & Paulhus, D. L. (2008). Unpublished SRP data from the Eugene–Springfield Community Sample. Eugene: Oregon Research Institute.
- Gregory, S., Blair, J. R., Ffytche, D., Simmons, A., Kumari, V., Hodgins, S., & Blackwood, N. (2015). Punishment and psychopathy: A case–control functional MRI investigation of reinforcement learning in violent antisocial personality disordered men. *Lancet Psychiatry*, 2, 153–160.
- Guay, J. P., Ruscio, J., Knight, R. A., & Hare, R. D. (2007). A taxometric analysis of the latent structure of psychopathy: Evidence for dimensionality. *Journal* of Abnormal Psychology, 116, 701–716.
- Guy, L. S., & Douglas, K. S. (2006). Examining the utility of the PCL:SV as a screening measure using competing factor models of psychopathy. *Psychological Assessment*, 18, 225–230.
- Guy, L. S., Kusaj, C., Packer, I. K., & Douglas, K. S. (2015). Influence of the HCR-20, LS/CMI, and PCL-R on decisions about parole suitability among lifers. *Law and Human Behavior*, 39, 232–243.
- Häkkänen-Nyholm, H., & Nyholm, J. O. (Eds.). (2012). Psychopathy and law: A practitioner's guide. Chichester, UK: Wiley-Blackwell.
- Hamilton, R. K. B., Hiatt Racer, K., & Newman, J. P. (2015). Impaired integration in psychopathy: A unified theory of psychopathic dysfunction. *Psychological Review*, 122, 770–791.
- Hare, R. D. (1965). Temporal gradient of fear arousal in psychopaths. *Journal of Abnormal Psychology*, 70, 442–445.

- Hare, R. D. (1980). A research scale for the assessment of psychopathy in criminal populations. *Personality* and Individual Differences, 1, 111–119.
- Hare, R. D. (1985). Comparison of the procedures for the assessment of psychopathy. *Journal of Consulting* and Clinical Psychology, 53, 7–16.
- Hare, R. D. (1991). The Hare Psychopathy Checklist—Revised. Toronto: Multi-Health Systems.
- Hare, R. D. (1996). Psychopathy: A clinical construct whose time has come. Criminal Justice and Behavior, 23, 25–54.
- Hare, R. D. (1998a). The Hare PCL-R: Some issues concerning its use and misuse. Legal and Criminological Psychology, 3, 101–123.
- Hare, R. D. (1998b). Psychopathy, affect, and behavior. In D. Cooke, A. Forth, & R. Hare (Eds.), Psychoapthy: Theory, research, and implications for society (pp. 105–137). Dordrecht, The Netherlands: Kluwer.
- Hare, R. D. (2003). The Hare Psychopathy Checklist— Revised (2nd ed.). Toronto: Multi-Health Systems.
- Hare, R. D. (2016). Psychopathy, the PCL-R, and criminal justice: Some new findings and current issues. *Canadian Psychology*, 57, 21–34.
- Hare, R, D., Black, P., & Walsh, Z. (2013). The PCL-R: Forensic applications and limitations. In R. P. Archer & E. M. Archer (Eds.), Forensic uses of clinical assessment instruments (2nd ed., pp. 230–265). New York: Routledge.
- Hare, R. D., & Cox, D. N. (1978). Clinical and empirical conceptions of psychopathy, and the selection of subjects for research. In R. D. Hare & D. Schalling (Eds.), *Psychopathic behavior: Approaches to research* (pp. 1–21). Chichester, UK: Wiley.
- Hare, R. D., & Frazelle, J. (1980). Some preliminary notes on the use of a research scale for the assessment of psychopathy in criminal populations. Unpublished manuscript, University of British Columbia, Vancouver, BC, Canada.
- Hare, R. D., & Neumann, C. S. (2006). The PCL-R assessment of psychopathy: Development, structural properties, and new directions. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 58–88). New York: Guilford Press.
- Hare, R. D., & Neumann, C. S. (2008). Psychopathy as a clinical and empirical construct. Annual Review of Clinical Psychology, 4, 217–246.
- Hare, R. D., & Neumann, C. S. (2010). The role of antisociality in the psychopathy construct. *Psychological Assessment*, 22, 446–454.
- Hare, R. D., Neumann, C. S., & Widiger, T. A. (2012). Psychopathy. In T. A. Widiger (Ed.), *The Oxford* handbook of personality disorders (pp. 478–504). New York: Oxford University Press.
- Hare, R. D., Williamson, S. E., & Harpur, T. J. (1988). Psychopathy and language. In T. E. Moffitt & S. A. Mednick (Eds.), *Biological contributions to crime causation* (pp. 68–92). Dordrecht, The Netherlands: Martinus Nijhoff.
- Harpur, T. J., Hakstian, A. R., & Hare, R. D. (1988).

Factor structure of the Psychopathy Checklist. Journal of Consulting and Clinical Psychology, 56, 741–747.

- Harpur, T. J., Hare, R. D., & Hakstian, R. (1989). A twofactor conceptualization of psychopathy: Construct validity and implications for assessment. *Psychological Assessment: A Journal of Consulting and Clinical Psychology*, 1, 6–17.
- Harris, G. T., Rice, M. E., & Cormier, C. A. (2013). Research and clinical scoring of the Psychopathy Checklist can show good agreement. *Criminal Justice* and Behavior, 20, 1–14.
- Harris, G. T., Rice, M. E., Hilton, N. Z., Lalumière, M. L., & Quinsey, V. L. (2007). Coercive and precocious sexuality as a fundamental aspect of psychopathy. *Journal of Personality Disorders*, 21, 1–27.
- Hart, S., Cox, D., & Hare, R. D. (1995). Manual for the Psychopathy Checklist: Screening Version (PCL: SV). Toronto: Multi-Health Systems.
- Haycock, D. A. (2014). Murderous minds: Exploring the criminal psychopathic brain. New York: Pegasus Books.
- Helmus, L., Thornton, D., Hanson, R. K., & Babchishin, K. M. (2012). Improving the predictive accuracy of Static-99 and Static-2002 with older sex offenders: Revised age weights. Sexual Abuse: A Journal of Research and Treatment, 24, 64–101.
- Hervé, H. (2007). Psychopathic subtypes: Historical and contemporary perspectives. In H. Hervé & J. C. Yuille (Eds.), *The psychopath: Theory, research, and practice* (pp. 431–460). Mahwah, NJ: Erlbaum.
- Hervé, H., & Yuille, J. C. (Eds.). (2007). The psychopath: Theory, research, and practice. Mahwah, NJ: Erlbaum.
- Hicks, B. M., Markon, K. E., Patrick, C. J., Krueger, R. F., & Newman, J. P. (2004). Identifying psychopathy subtypes on the basis of personality structure. *Psychological Assessment*, 16, 276–288.
- Higgs, T., Tully, R. J., & Browne, K. D. (2017). Psychometric Properties in Forensic application of the Screening Version of the Psychopathy Checklist. International Journal of Offender Therapy and Comparative Criminology. [Epub ahead of print]
- Hill, C., Neumann, C. S., & Rogers, R. (2004). Confirmatory factor analysis of the Psychopathy Checklist: Screening Version in offenders with Axis I disorders. *Psychological Assessment*, 16, 90–95.
- Hillege, S., de Ruiter, C., Smits, N., van der Baan, H., & Das, J. (2011). Structural and metric validity of the Dutch translation of Psychopathy Checklist: Youth Version (PCL:YV). International Journal of Forensic Mental Health, 10, 346–357.
- Hoppenbrouwers, S. S., Bulten, B. H., & Brazil, I. A. (2016). Parsing fear: A reassessment of the evidence for fear deficits in psychopathy. *Psychological Bulletin*, 142, 573–600.
- Hoppenbrouwers, S. S., Neumann, C. S., Lewis, J., & Johansson, P. (2015). A latent variable analysis of the Psychopathy Checklist–Revised and behavioral inhibition system/behavioral activation system factors in North American and Swedish offenders. Personality Disorders: Theory, Research, and Treatment, 6, 251–260.

- Hurducas, C. C., Singh, J. P., de Ruiter, C., & Petrila, J. (2014). Violence risk assessment tools: A systematic review of surveys. *International Journal of Forensic Mental Health*, 13, 181–192.
- Ismail, G., & Looman, J. (2018). Field inter-rater reliability of the Psychopathy Checklist—Revised. International Journal of Offender Therapy and Comparative Criminology, 62, 468–481.
- Jackson, R. L., Neumann, C. S., & Vitacco, M. J. (2007). Impulsivity, anger, and psychopathy: The moderating effect of ethnicity. *Journal of Personality Disorders*, 21, 289–304.
- Jüriloo, A., Lauerma, H., Holmalahti, T., Tyni, S., Aarnio, J., Viitanen, P., et al. (2014). Psychopathic traits in a representative sample of Finnish male prisoners. *Nordic Journal of Psychiatry*, 68, 117–122.
- Karpman, B. (1961). The structure of neurosis: With special differentials between neurosis, psychosis, homosexuality, alcoholism, psychopathy, and criminality. Archives of Criminal Psychodynamics, 4, 599–646.
- Khiroya, R., Weaver, T., & Maden, T. (2009). Use and perceived utility of structured violence risk assessments in English medium secure forensic units. *Psychiatric Bulletin*, 33, 129–132.
- Kiehl, K. A. (2014). The psychopath whisperer: The science of those without conscience. New York: Crown.
- Kiehl, K., & Sinnott-Armstrong, W. (Eds.). (2013). Handbook on psychopathy and law. New York: Oxford University Press.
- Knowles, E. S., & Condon, C. A. (2000). Does the rose still smell as sweet?: Item variability across test forms and revisions. *Psychological Assessment*, 12, 245–252.
- Koenigs, M., Baskin-Sommers, A., Zeier, J., & Newman, J. P. (2011). Investigating the neural correlates of psychopathy: A critical review. *Molecular Psychiatry*, 16, 792–799.
- Köhler, D., Geiger, F., & Huchzermeier, C. (2013). Two, three or four factors?: Internal and external validity of different factor models of the German Psychopathy Checklist: Screening Version. *Praxis der Recht*spsychologie, 23, 469–481.
- Kolla, N. J., Gregory, S., Attard, S., Blackwood, N., & Hodgins, S. (2014). Disentangling possible effects of childhood physical abuse on gray matter changes in violent offenders with psychopathy. *Psychiatry Research: Neuroimaging*, 221, 123–126.
- Kosson, D. S., Lorenz, A. R., & Newman, J. P. (2006). Effects of comorbid psychopathy on criminal offending and emotion processing in male offenders with antisocial personality disorder. *Journal of Abnormal Psychology*, 115, 798–806.
- Kosson, D. S., Neumann, C. S., Forth, A. E., Salekin, R. T., Hare, R. D., Krischer, M. K., et al. (2013). Factor structure of the Hare Psychopathy Checklist: Youth Version (PCL:YV) in adolescent females. *Psychological Assessment*, 25, 71–83.
- Kristic, S., Neumann, C. S., Roy, S., Robertson, C., & Hare, R. D. (2017, April 13). Using latent variable- and

person-centered approaches to examine the role of psychopathic traits in sex offenders. [Epub ahead of print]

- Krueger, R. F., Derringer, J., Markon, K. E., Watson, D., & Skodol, A. E. (2012). Initial construction of a maladaptive personality trait model and inventory for DSM-5. *Psychological Medicine*, 42, 1879–1890.
- Kubak, F. A., & Salekin, R. T. (2009). Psychopathy and anxiety in children and adolescents: New insights on developmental pathways to offending. *Journal of Psychopathology and Behavior Assessment*, 31, 271–284.
- Lally, S. J. (2003). What tests are acceptable for use in forensic evaluations?: A survey of experts. Professional Psychology: Research and Practice, 34, 491–498.
- Lalumière, M. L., Mishra, S., & Harris, G. T. (2008). In cold blood: The evolution of psychopathy. In J. Duntley & T. K. Shackelford (Eds.), *Evolutionary fo*rensic psychology (pp. 176–197). Oxford, UK: Oxford University Press.
- Larsson, H., Tuvblad, C., Rijsdijk, F. V., Andershed, H., Grann, M., & Lichtenstein, P. (2007). A common genetic factor explains the association between psychopathic personality and antisocial behavior. *Psychological Medicine*, 37, 15–26.
- Leistico, A. M., Salekin, R. T., DeCoster, J., & Rogers, R. (2008). A large-scale meta-analysis relating the Hare measures of psychopathy to antisocial conduct. *Law and Human Behavior*, 32, 28–45.
- Lilienfeld, S. O., Smith, S. F., Sauvigné, K. C., Patrick, C. J., Drislane, L. E., Latzman, R. D., et al. (2016). Is boldness relevant to psychopathic personality?: Meta-analytic relations with non-Psychopathy Checklist-based measures of psychopathy. *Psychological As*sessment, 28, 1172–1185.
- Livesley, W. J. (2007). A framework for integrating dimensional and categorical classifications of personality disorder. *Journal of Personality Disorders*, 21, 199–224.
- Lloyd, C. D., Clark, H. J., & Forth, A. E. (2010). Psychopathy, expert testimony, and indeterminate sentences: Exploring the relationship between Psychopathy Checklist—Revised testimony and trial outcome in Canada. *Legal and Criminological Psychol*ogy, 15, 323–339.
- Lockwood, P. L., Bird, G., Bridge, M., & Viding, E. (2013, November). Dissecting empathy: High levels of psychopathic and autistic traits are characterized by difficulties in different social information processing domains. *Frontiers in Human Neuroscience*, 7, Article No. 760.
- Loney, B. R., Taylor, J., Butler, M. A., & Iacono, W. G. (2007). Adolescent psychopathy features: 6-year temporal stability and the prediction of externalizing symptoms during the transition to adulthood. Aggressive Behavior, 33, 242–252.
- Luna, E. (2013). Psychopathy and sentencing. In K. Kiehl & W. Sinnott-Armstrong (Eds.), *Handbook on psychopathy and law* (pp. 358–388). New York: Oxford University Press.
- Lushing, J. R., Gaudet, L. M., & Kiehl, K. A. (2015).

Brain Imaging in psychopathy. In C. B. Gacono (Ed.), The clinical and forensic assessment of psychopathy: A practitioner's guide (2nd ed., pp. 32–53). New York: Routledge.

- Lykken, D. T. (1957). A study of anxiety in the sociopathic personality. *Journal of Abnormal and Social Psychology*, 55, 6–10.
- Lynam, D. R. (1997). Pursuing the psychopath: Capturing the fledgling psychopath in a nomological net. *Journal of Abnormal Psychology*, 106, 425–438.
- Lynam, D. R., Derefinko, K. J., Caspi, A., Loeber, R., & Stouthamer-Loeber, M. (2007). The content validity of juvenile psychopathy: An empirical examination. *Psychological Assessment*, 19, 363–367.
- Lynam, D. R., & Gudonis, L. (2005). The development of psychopathy. Annual Review of Clinical Psychology, 1, 381–407.
- Lynam, D. R., & Miller, J. D. (2012). Fearless dominance and psychopathy: A response to Lilienfeld et al. Personality Disorders: Theory, Research, and Treatment, 3, 341–353.
- Lynam, D. R., & Vachon, D. D. (2012). Antisocial personality disorder in DSM-5: Missteps and missed opportunities. Personality Disorders: Theory, Research, and Treatment, 3, 483–495.
- Mager, K. L., Bresin, K., & Verona, E. (2014). Gender, psychopathy factors, and intimate partner violence. Personality Disorders: Theory, Research, and Treatment, 5, 257–267.
- Mahmut, M. K., Homewood, J., & Stevenson, R. J. (2008). The characteristics of non-criminals with high psychopathy traits: Are they similar to criminal psychopaths? *Journal of Research in Personality*, 42, 679–692.
- Mahmut, M. K., Menictas, C., Stevenson, R. J., & Homewood, J. (2011). Validating the factor structure of the Self-Report Psychopathy Scale in a community sample. Psychological Assessment, 23, 670–678.
- Malterer, M. B., Lilienfeld, S. O., Neumann, C. S., & Newman, J. P. (2010). Concurrent validity of the Psychopathic Personality Inventory with offender and community samples. Assessment, 17, 3–15.
- Marcus, D. K., Lilienfeld, S. O., Edens, J. E., & Poythress, G. (2006). Is antisocial personality disorder continuous or categorical?: A taxometric analysis. *Psychological Medicine*, 36, 1571–1581.
- Mathieu, C., Babiak, P., & Hare, R. D. (in press). Psychopathy in the workplace. In A. R. Felthous & H. Sass (Eds.), International handbook on psychopathic disorders and the law (2nd ed.). New York: Wiley.
- Mathieu, C., Hare, R. D., Jones, D. N., Babiak, P., & Neumann, C. S. (2013). Factor structure of the B-Scan 360: A measure of corporate psychopathy. Psychological Assessment, 25, 288–293.
- Mathieu, C., Neumann, C., Babiak, P., & Hare, R. D. (2015). Corporate psychopathy and the Full Range Leadership Model. Assessment, 22, 267–278.
- Mathieu, C., Neumann, C. S., Hare, R. D., & Babiak, P. (2014). A dark side of leadership: Corporate psy-

chopathy and its influence on employee well-being and job satisfaction. *Personality and Individual Differences*, 59, 83–88.

- McCahey, J. P., & Proman, J. M. (2011, June 30). Federal Rule of Evidence 706: Court-Appointed Experts. Chicago: American Bar Association. Available from http://apps.americanbar.org/litigation/committees/trialevidence/articles/summer2011-rule-706-court-appointed-experts.html.
- McCord, W., & McCord, J. (1964). The psychopath: An essay on the criminal mind. Princeton, NJ: Van Nostrand.
- McCoy, W. K., & Edens, J. F. (2006). Do black and white youths differ in levels of psychopathic traits?: A meta-analysis of the Psychopathy Checklist Measures. Journal of Consulting and Clinical Psychology, 74, 386–392.
- Mealey, L. (1995a). Primary sociopathy (psychopathy) is a type, secondary is not. Behavioral and Brain Sciences, 18, 579–599.
- Mealey, L. (1995b). The sociobiology of sociopathy: An integrated evolutionary model. Behavioral and Brain Sciences, 18, 523–599.
- Meloy, J. R. (1988). The psychopathic mind: Origins, dynamics, and treatments. Northvale, NJ: Jason Aronson.
- Miller, J. D., Lamkin, J., Maples-Keller, J. L., Sleep, C. E., & Lynam, D. R. (2017). A test of the empirical profile and coherence of the DSM-5 psychopathy specifier. *Psychological Assessment.* [Epub ahead of print]
- Miller, J. D., & Lynam, D. R. (2012). An examination of the Psychopathic Personality Inventory's nomological network: A meta-analytic review. Personality Disorders: Theory, Research, and Treatment, 3, 305–326.
- Miller, J. D., & Lynam, D. R. (2015). Psychopathy and personality: Advances and debates. *Journal of Personality*, 83, 585–592.
- Miller, J. D., Lynam, D. R., Widiger, T. A., & Leukefeld, C. (2001). Personality disorders as extreme variants of common personality dimensions: Can the Five Factor Model adequately represent psychopathy? *Journal of Personality*, 69, 253–276.
- Millon, T., Simonson, E., & Birket-Smith, M. (1998). Historical conceptions of psychopathy in the United States and Europe. In T. Millon, E. Simonson, M. Birket-Smith, & R. D. Davis (Eds.), *Psychopathy: Antisocial, criminal, and violent behavior* (pp. 3–31). New York: Guilford Press.
- Millsap, R. E., & Olivera-Aguilar, M. (2012). Investigating measurement invariance using confirmatory factor analysis. In R. H. Hoyle (Ed.), *Handbook of structural equation modeling* (pp. 380–392). New York: Guilford Press.
- Minzenberg, M. J., & Siever, L. J. (2006). Neurochemistry and pharmacology of psychopathy and related disorders. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 251–277). New York: Guilford Press.
- Mokros, A., Habermeyer, F., & Küchenhoff, H. (2017). The uncertainty of psychological and psychiatric

diagnoses. *Psychological Assessment*. [Epub ahead of print]

- Mokros, A., Habermeyer, E., Neumann, C. S., Schilling, F., Hare, R. D., & Eher, R. (2014). Assessment of psychopathy in Austria: Psychometric properties of the Psychopathy Checklist—Revised. European Journal of Psychological Assessment, 30, 243–250.
- Mokros, A., Hare, R. D., Neumann, C. S., Santtila, P., Habermeyer, E., & Nitschke, J. (2015). Variants of psychopathy in adult male offenders: A latent profile analysis. *Journal of Abnormal Psychology*, 124, 372–386.
- Mokros, A., Hollerbach, P., Nitschke, J., & Habermeyer, E. (2017). Deutschsprachige Version der Hare Psychopathy Checklist-Revised (PCL-R). Göttingen, Germany: Hogrefe.
- Mokros, A., Hollerbach, P., Vohs, K., Nitschke, J., Eher, R., & Habermeyer, E. (2013). Normative data for the Psychopathy Checklist in German-speaking countries: A meta-analysis. Criminal Justice and Behavior, 40, 1397–1412.
- Mokros, A., Neumann, C. S., Stadtland, C., Osterheider, M., Nedopil, N., & Hare, R. D. (2011). Assessing measurement invariance of PCL-R assessments from file reviews of North-American and German offenders. International Journal of Law and Psychiatry, 34, 56–63.
- Mokros, A., Vohs, K., & Habermeyer, E. (2014). Psychopathy and violent reoffending in German-speaking countries: A meta-analysis. European Journal of Psychological Assessment, 30, 117–129.
- Morse, S. J. (2013). Preventative detention of psychopaths and dangerous offenders. In K. Kiehl & W. Sinnott-Armstrong (Eds.), *Handbook on psychopathy* and law (pp. 321–345). New York: Oxford University Press.
- Murphy, B., Lilienfeld, S., Skeem, J., & Edens, J. F. (2016). Are fearless dominance traits superfluous in operationalizing psychopathy?: Incremental validity and sex differences. *Psychological Assessment*, 28, 1597–1607.
- Murrie, D. C., Boccaccini, M. T., Guarnera, L. A., & Rufino, K. A. (2013). Are forensic experts biased by the side that retained them? *Psychological Science*, 24, 1889–1897.
- Murrie, D. C., Marcus, D. K., Douglas, K. S., Lee, Z., Salekin, R. T., & Vincent, G. (2007). Youth with psychopathy features are not a discrete class: A taxometric analysis. *Journal of Child Psychology and Psychiatry*, 48, 714–723.
- Muthén, L. K., & Muthén, B. O. (1998–2017). Mplus User's Guide (8th ed.). Los Angeles: Muthén & Muthén.
- Nathanson, C., Paulhus, D. L., & Williams, K. M. (2006). Predictors of a behavioral measure of scholastic cheating: Personality and competence but not demographics. Contemporary Educational Psychology, 31, 97–122.
- Neal, T. M. S., & Grisso, T. (2014). Assessment prac-

tices and expert judgment methods in forensic psychology and psychiatry: An international snapshot. *Criminal Justice and Behavior*, 41, 1406–1421.

- Neal, T. M. S., & Sellbom, M. (2012). Examining the factor structure of the Hare Self-Report Psychopathy (SRP) Scale. *Journal of Personality Assessment*, 94, 244–253.
- Neumann, C. S. (2007). Correspondence: Psychopathy. British Journal of Psychiatry, 191, 357–358.
- Neumann, C. S., & Hare, R. D. (2008). Psychopathic traits in a large community sample: Links to violence, alcohol use, and intelligence. *Journal of Consulting and Clinical Psychology*, 76, 893–899.
- Neumann, C. S., Hare, R. D., & Johansson, P. J. (2013). The Psychopathy Checklist—Revised (PCL-R), low anxiety, and fearlessness: A structural equation modeling analysis. *Personality Disorders: Theory Research,* and Treatment, 4, 129–137.
- Neumann, C. S., Hare, R. D., Mokros, A., Baskin-Sommers, A., Knight, R., & Kristic, S. (2015). Using latent profile analysis to uncover PCL-based subtypes: Data from across the globe. Presentation at the biennial meeting of the Society for the Scientific Study of Psychopathy, Chicago, IL.
- Neumann, C. S., Hare, R. D., & Newman, J. P. (2007). The super-ordinate nature of the Psychopathy Checklist—Revised. Journal of Personality Disorders, 21, 102–117.
- Neumann, C. S., Hare, R. D., & Pardini, D. A. (2015). Antisociality and the construct of psychopathy: Data from across the globe. *Journal of Personality*, 83, 678–692.
- Neumann, C. S., Hare, R. D., Pardini, D. A., & Brand, E. (2017). Longitudinal stability and cross-lag effects of psychopathic traits. Manuscript in preparation.
- Neumann, C. S., Kosson, D. S., Forth, A. E., & Hare, R. D. (2006). Factor structure of the Hare Psychopathy Checklist: Youth Version in incarcerated adolescents. *Psychological Assessment*, 18, 142–154.
- Neumann, C. S., & Pardini, D. (2014). Factor structure and construct validity of the Self-Report Psychopathy (SRP) Scale and the Youth Psychopathic Traits Inventory (YPI) in young men. *Journal of Personality Disorders*, 28, 419–433.
- Neumann, C. S., Schmitt, D. S., Carter, R., Embley, I., & Hare, R. D. (2012). Psychopathic traits in females and males across the globe. *Behavioral Sciences and the Law*, 30, 557–574.
- Neumann, C. S., Uzieblo, K., Crombez, G., & Hare, R. D. (2013). Understanding the Psychopathic Personality Inventory (PPI) in terms of the unidimensionality, orthogonality, and construct validity of PPI-I and -II. Personality Disorders: Theory, Research, and Treatment, 4, 77–79.
- Neumann, C. S., Vitacco, M. J., Hare, R. D., & Wupperman, P. (2005). Reconstruing the "reconstruction" of psychopathy: A comment on Cooke, Michie, Hart, & Clark. Journal of Personality Disorders, 19, 624–640.

Neumann, C. S., Vitacco, M. J., & Mokros, A. S. (2016).

Using both variable-centered and person-centered approaches to understanding psychopathic personality. In C. B. Gacono (Ed.), *The clinical and forensic assessment of psychopathy: A practitioner's guide* (2nd ed., pp. 14–31). New York: Routledge.

- Newman, J. P., Curtin, J. J., Bertsch, J. D., & Baskin-Sommers, A. R. (2010). Attention moderates the fearlessness of psychopathic offenders. *Biological Psychiatry*, 67, 66–70.
- Newman, J. P., MacCoon, D. G., Vaughn, L. J., & Sadeh, N. (2005). Validating a distinction between primary and secondary psychopathy with measures of Gray's BIS and BAS constructs. *Journal of Abnormal Psychology*, 114, 319–323.
- Newman, J. P., & Malterer, M. B. (2009). Problems with the BIS/BAS scales or Lykken's model of primary psychopathy?: A reply to Poythress et al. (2008). Personality and Individual Differences, 46, 673–677.
- Ogloff, J. R. P. (2006). Psychopathy/antisocial personality disorder conundrum. Australian and New Zealand Journal of Psychiatry, 40, 519–528.
- Ogloff, J. R. P., Lyon, D., & Shepherd, S. M. (2016). Legal and ethical issues in psychopathy assessment. In C. B. Gacono (Ed.), *The clinical and forensic assessment of psychopathy: A practitioner's guide* (2nd ed., pp. 193–216). New York: Routledge.
- Olver, M. E., Neumann, C. S., Wong, S. C. P., & Hare, R. D. (2013). The structural and predictive properties of the Psychopathy Checklist—Revised in Canadian aboriginal and non-aboriginal offenders. *Psychological Assessment*, 25, 167–179.
- Olver, M. E., & Wong, S. C. P. (2015). Short- and longterm recidivism prediction of the PCL-R and the effects of age: A 24-year follow-up. Personality Disorders: Theory, Research, and Treatment, 6(1), 97–105.
- Pardini, D. A., Raine, A., Erickson, K., & Loeber, R. (2014). Lower amygdala volume in men is associated with childhood aggression, early psychopathic traits, and future violence. *Biological Psychiatry*, 75, 73–80.
- Patrick, C. J. (2006a). Back to the future: Cleckley as a guide to the next generation of psychopathy research. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 605–617). New York: Guilford Press.
- Patrick, C. J. (Ed.). (2006b). Handbook of psychopathy. New York: Guilford Press.
- Patrick, C. J. (2007). Antisocial personality disorder and psychopathy. In W. O'Donohue, K. A. Fowler, & S. O. Lilienfeld (Eds.), *Personality disorders: Towards the* DSM-V (pp. 109–166). New York: SAGE.
- Patrick, C. J., & Bernat, E. M. (2009). Neurobiology of psychopathy: A two-process theory. In G. G. Berntson & J. T. Cacioppo (Eds.), *Handbook of neuroscience for the behavioral sciences* (pp. 1110–1131). New York: Wiley.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, 21, 913–938.
- Patrick, C. J., Hicks, B. M., Nichol, P. E., & Krueger, R.

F. (2007). A bifactor approach to modeling the structure of the Psychopathy Checklist—Revised. *Journal* of Personality Disorders, 21, 118–141.

- Paulhus, D. L., Neumann, C. S., Hare, R. D., Williams, K. M., & Hemphill, J. F. (2016). Self-Report Psychopathy Scale (4th ed.). Toronto: Multi-Health Systems.
- Porter, S., ten Brinke, L., & Wilson, K. (2009). Crime profiles and conditional release performance of psychopathic and non-psychopathic sexual offenders. *Legal and Criminological Psychology*, 14, 109–118.
- Poythress, N. G., Edens, J. F., Skeem, J. L., Lilienfeld, S. O., Douglas, K. S., Frick, P. J., et al. (2010). Identifying subtypes among offenders with antisocial personality disorder: A cluster-analytic study. *Journal of Abnormal Psychology*, 119, 389–400.
- Quinsey, V. L., Harris, G. T., Rice, M. E., & Cormier, C. (2005). Violent offenders: Appraising and managing risk (2nd ed.). Washington, DC: American Psychological Association.
- Raine, A., & Glenn, A. L. (2014). Psychopathy: An introduction to biological findings and their implications. New York: New York University Press.
- Rice, M. E., & Harris, G. T. (2013). Psychopathy and violent recidivism. In K. Kiehl & W. Sinnott-Armstrong (Eds.), Handbook on psychopathy and law (pp. 231–249). New York: Oxford University Press.
- Riser, R. E., & Kosson, D. S. (2013). Criminal behavior and cognitive processing in male offenders with antisocial personality disorder with and without comorbid psychopathy. *Personality Disorders: Theory*, *Research, and Treatment*, 4, 332–340.
- Robins, L. N. (1966). Deviant children grown up. Baltimore: Williams & Wilkins.
- Robins, L. N. (1978). Aetiological implications in studies of childhood histories relating to antisocial personality. In R. D. Hare & D. Schalling (Eds.), *Psychopathic behavior: Approaches to research* (pp. 255–271). Chichester, UK: Wiley.
- Rufino, K. A., Boccaccini, M. T., Hawes, S. W., & Murrie, D. C. (2012). When experts disagreed, who was correct?: A comparison of PCL-R scores from independent raters and opposing forensic experts. *Law* and Human Behavior, 36, 527–537.
- Salekin, R. T. (2002). Psychopathy and therapeutic pessimism: Clinical lore or clinical reality? *Clinical Psy*chology Review, 22, 79–112.
- Salekin, R. T., & Lynam, D. R. (Eds.). (2010). Handbook of child and adolescent psychopathy. New York: Guilford Press.
- Salekin, R. T., Neumann, C. S., Leistico, A. R., DiCicco, T. M., & Duros, R. L. (2004). Psychopathy and comorbidity in a young offender sample: Taking a closer look at psychopathy's potential importance over disruptive behavior disorders. *Journal of Abnormal Psychology*, 113, 416–427.
- Samuel, D. B., Lynam, D. R., Widiger, T. A., & Ball, S. A. (2012). An expert consensus approach to relating the proposed DSM-5 types and traits. *Personality Disorders: Theory, Research, and Treatment, 3*, 1–16.

- Schneider, K. (1950). Die psychopathischen persönlichkeiten [The psychopathic personalities] (5th ed.). Vienna, Austria: Deuticke. (Original work published 1923)
- Schrum, C. L., & Salekin, R. T. (2006). Psychopathy in adolescent female offenders: An item response theory analysis of the Psychopathy Checklist: Youth Version. Behavioral Sciences and the Law, 24, 39–63.
- Seara-Cardoso, A., Doldberg, H., Neumann, C., Roiser, J. P., & Viding, E. (2013). Empathy, morality and psychopathic traits in women. *Personality and Individual Differences*, 55, 328–333.
- Seara-Cardoso, A., Neumann, C., Roiser, J., McCrory, E., & Viding, E. (2012). Investigating associations between empathy, morality and psychopathic personality traits in the general population. *Personality and Individual Differences*, 52, 67–71.
- Seara-Cardoso, A., & Viding, E. (2015). Functional neuroscience of psychopathic personality in adults. *Journal of Personality*, 83, 723–737.
- Serin, R. C., Brown, S. L., & De Wolf, A. H. (2016). The clinical use of the Hare Psychopathy Checklist—Revised (PCL-R) in contemporary risk assessment. In C. B. Gacono (Ed.), The clinical and forensic assessment of psychopathy: A practitioner's guide (2nd ed., pp. 293–310). New York: Routledge.
- Silverstein, M. L., & Nelson, L. D. (2000). Clinical and research implications of revising psychological tests. *Psychological Assessment*, 12, 298–303.
- Singh, J. P., Bjørkly, S., & Fazel, S. (Eds.). (2016). International perspectives on violence risk assessment (American Psychology–Law Society Series). New York: Oxford University Press.
- Singh, J. P., Desmarais, S. L., Hurducas, C., Arbach-Lucioni, K., Condemarin, C., Kimberlie, D., et al. (2014). International perspectives on the practical application of violence risk assessment: A global survey of 44 countries. *International Journal of Forensic Mental Health*, 13, 193–206.
- Skeem, J. L., & Cooke, D. J. (2010). Is criminal behavior a central component of psychopathy?: Conceptual directions for resolving the debate. *Psychological As*sessment, 22, 433–445.
- Skeem, J. L., Johansson, P., Andershed, H., Kerr, M., & Louden, J. E. (2007). Two subtypes of psychopathic violent offenders that parallel primary and secondary variants. *Journal of Abnormal Psychology*, 116, 395–409.
- Skeem, J. L., & Mulvey, E. P. (2001). Psychopathy and community violence among civil psychiatric patients: Results from the MacArthur Violence Risk Assessment study. *Journal of Consulting and Clinical Psychology*, 69, 358–374.
- Skodol, A. E., Bender, D. S., Morey, L. C., Clark, L. A., Oldham, J. M., Alarcon, R. D., et al. (2011). Personality disorder types proposed for DSM-5. *Journal of Personality Disorders*, 25, 136–169.
- Smith, G. T., McCarthy, D. M., & Zapolski, T. C. B. (2009). On the value of homogeneous constructs for

construct validation, theory testing, and the description of psychopathology. *Psychological Assessment*, 21, 272–284.

- Steadman, H., Mulvey, E., Monahan, J., Robbins, P., Appelbaum, P., Grisso, T., et al. (1998). Violence by people discharged from acute psychiatric inpatient facilities and by others in the same neighborhoods. *Archives of General Psychiatry*, 55, 393–401.
- Storey, J. E., Hart, S. D., Cooke, D. J., & Michie, C. (2016). Psychometric properties of the Hare Psychopathy Checklist—Revised (PCL-R) in a representative sample of Canadian federal offenders. *Law and Human Behavior*, 40, 136–146.
- Strauss, E., Spreen, O., & Hunter, M. (2000). Implications of test revisions for research. *Psychological As*sessment, 12, 237–244.
- Strickland, C. M., Drislane, L. E., Lucy, M., Krueger, R. F., & Patrick, C. J. (2013). Characterizing psychopathy using DSM-5 personality traits. Assessment, 20, 327–338.
- Sundram, F., Deeley, Q., Sarkar, S., Daly, E., Latham, R., Craig, M., et al. (2012). White matter microstructural abnormalities in the frontal lobe of adults with antisocial personality disorder. *Cortex*, 48, 216–229.
- Sylvers, P., Lilienfeld, S. O., & LaPrairie, J. L. (2011). Differences between trait fear and trait anxiety: Implications for psychopathology. *Clinical Psychology Review*, 132, 122–137.
- Tsang, S., Schmidt, K. M., Vincent, G. M., Salekin, R. T., Moretti, M. M., & Odgers, C. L. (2015). Assessing psychopathy among justice involved adolescents with the PCL:YV: An item response theory examination across gender. Personality Disorders: Theory, Research, and Treatment, 6, 22–31.
- Vachon, D. D., Lynam, D. R., Loeber, R., & Stouthamer-Loeber, M. (2012). Generalizing the nomological network of psychopathy across populations differing on race and conviction status. *Journal of Abnormal Psychology*, 121, 263–269.
- Vachon, D. D., Lynam, D. R., Widiger, T. A., Miller, J. D., McCrae, R. R., & Costa, P. T. (2013). Basic traits predict the prevalence of personality disorder across the lifespan: The example of psychopathy. *Psychological Science*, 24, 698–705.
- Venables, N. C., Hall, J. R., & Patrick, C. J. (2014). Differentiating psychopathy from antisocial personality disorder: A triarchic model perspective. *Psychological Medicine*, 44, 1005–1013.
- Vermunt, J. K., & Magidson, J. (2006). Latent class cluster analysis. In J. A. Hagenaars & A. L. McCutcheon (Eds.), Applied latent class analysis (pp. 89–106). New York: Cambridge University Press.
- Viding, E., Blair, R. J. R., Moffitt, T. E., & Plomin, R. (2005). Evidence for substantial genetic risk for psychopathy in 7-year olds. *Journal of Child Psychology* and Psychiatry, 46, 592–597.
- Viding, E., & McCrory, E. J. (2012). Genetic and neurocognitive contributions to the development of

psychopathy. Development and Psychopathology, 24, 969–983.

- Vitacco, M. J., Neumann, C. S., & Caldwell, M. F. (2010). Predicting antisocial behavior in high-risk male adolescents: Contributions of psychopathy and instrumental violence. *Criminal Justice and Behavior*, 37, 833–846.
- Vitacco, M. J., Neumann, C. S., Caldwell, M. F., Leistico, A. M., & Van Rybroek, G. J. (2006). Testing factor models of the Psychopathy Checklist: Youth Version and their association with instrumental violence. *Journal of Personality Assessment*, 87, 74–83.
- Vitacco, M. J., Neumann, C. S., & Jackson, R. (2005). Testing a four-factor model of psychopathy and its association with ethnicity, gender, intelligence, and violence. *Journal of Consulting and Clinical Psychol*ogy, 73, 466–478.
- Vitacco, M. J., Neumann, C. S., & Pardini, D. A. (2014). Predicting future criminal offending in a community-based sample of males using self-reported psychopathy. *Criminal Justice and Behavior*, 41, 345–363.
- Vitacco, M. J., & Vincent, G. M. (2006). Understanding the downward extension of psychopathy to youth: Implications for risk assessment and juvenile justice. International Journal of Forensic Mental Health, 5, 29–38.
- Wallace, J. F., Malterer, M. B., & Newman, J. P. (2009). Mapping Gray's BIS and BAS constructs onto Factor 1 and Factor 2 of Hare's Psychopathy Checklist— Revised. Personality and Individual Differences, 47, 812–816.
- Walters, G. D. (2014). The latent structure of psychopathy in male adjudicated delinquents: A cross-domain taxometric analysis. Personality Disorders: Theory, Research, and Treatment, 5, 348–355.
- Walters, G. D. (2015). A two-dimensional model of psychopathy and antisocial behavior: A multi-sample investigation using items from the Psychopathy Checklist—Revised. Personality and Individual Differences, 78, 88–93.
- Walters, G. D., Duncan, S. A., & Mitchell-Perez, K. (2007). The latent structure of psychopathy: A taxometric investigation of the Psychopathy Checklist— Revised in a heterogeneous sample of male prison inmates. Assessment, 14, 270–278.
- Walters, G. D., Ermer, E., Knight, R. A., & Kiehl, K. A. (2015). Paralimbic biomarkers in taxometric analyses of psychopathy: Does changing the indicators change the conclusion? *Personality Disorders: Theory*, *Research, and Treatment*, 6, 41–52.
- Walters, G. D., & Kiehl, K. A. (2015). Limbic correlates of fearlessness and disinhibition in incarcerated youth: Exploring the brain–behavior relationship with the Hare Psychopathy Checklist: Youth Version. Psychiatry Research, 230, 205–210.
- Warren, J. I., & Burnette, M. (2013). The multifaceted construct of psychopathy: Association with APD, clinical, and criminal characteristics among male

and female inmates. International Journal of Forensic Mental Health, 12, 265–273.

- Webster, C., Douglas, K., Eaves, D., & Hart, S. (1997). HCR-20: Assessing risk for violence, Version 2. Burnaby, BC: Mental Health, Law, and Policy Institute, Simon Fraser University.
- Welker, K. M., Lozoya, E., Campbell, J. A., Neumann, C. S., & Carré, J. M. (2014). Testosterone, cortisol, and psychopathic traits in men and women. *Physiol*ogy and Behavior, 129, 230–236.
- Westen, D., & Weinberger, J. (2004). When clinical description becomes statistical prediction. American Psychologist, 59, 595–613.
- Widiger, T. A., Cadoret, R., Hare, R. D., Robins, L., Rutherford, M., Zanarini, M., et al. (1996). DSM-IV antisocial personality disorder field trial. *Journal of Abnormal Psychology*, 105, 3–16.
- Widiger, T. A., & Mullins-Sweatt, S. N. (2009). Fivefactor model of personality disorder: A proposal for DSM-IV. Annual Review of Clinical Psychology, 5, 197–220.
- Willemsen, J., Vanheule, S., & Verhaeghe, P. (2011). Psychopathy and lifetime experiences of depression. *Criminal Behaviour and Mental Health*, 21, 279–294.
- Williams, K. M., Paulhus, D. L., & Hare, R. D. (2007). Capturing the four-factor structure of psychopathy in college students via self-report. *Journal of Personality Assessment*, 88, 205–219.
- Williamson, S. E., Harpur, T. J., & Hare, R. D. (1991). Abnormal processing of affective words by psychopaths. *Psychophysiology*, 28, 260–273.
- Wilson, L., Miller, J. D., Zeichner, A., Lynam, D. R., & Widiger, T. A. (2011). An examination of the validity of the Elemental Psychopathy Assessment: Relations with other psychopathy measures, aggression, and externalizing behaviors. Journal of Psychopathology and Behavioral Assessment, 33, 315–322.
- Wilson, M. J., Abramowitz, C., Vasilev, G., Bozgunov, K., & Vassileva, J. (2014). Psychopathy in Bulgaria: The cross-cultural generalizability of the Hare Psychopathy Checklist. Journal of Psychopathology and Behavioral Assessment, 36, 389–400.
- Wolf, R. C., Carpenter, R. W., Warren, C. M., Zeier, J.

D., Baskin-Sommers, A. R., & Newman, J. P. (2012). Reduced susceptibility to the attentional blink in psychopathic offenders: Implications for the attention bottleneck hypothesis. *Neuropsychology*, 26, 102–109.

- Woodworth, M., & Porter, S. (2002). In cold blood: Characteristics of criminal homicides as a function of psychopathy. *Journal of Abnormal Psychology*, 111, 436–445.
- Wygant, D., Sellbom, M., Sleep, C. E., Wall, T. D., Applegate, K. C., Kreuger, R. F., et al. (2016). Examining the DSM-5 Alternative Personality Disorder Model operationalization of antisocial personality disorder and psychopathy in a male correctional sample. *Personality Disorders: Theory, Research, and Treatment,* 7, 229–239.
- Yang, M., Wong, S. C. P., & Coid, J. (2010). The efficacy of violence prediction: A meta-analytic comparison of nine risk assessment tools. *Psychological Bulletin*, 136, 740–767.
- Yang, Y., & Raine, A. (2009). Prefrontal structural and functional brain imaging findings in antisocial, violent, and psychopathic individuals: A meta-analysis. *Psychiatry Research: Neuroimaging*, 174, 81–88.
- Yang, Y., Raine, A., Lencz, T., Bihrle, S., LaCasse, L., & Colletti, P. (2005). Volume reduction in prefrontal gray matter in unsuccessful criminal psychopaths. *Biological Psychiatry*, 57, 1103–1108.
- Zeier, J. D., & Newman, J. P. (2013). Feature-based attention and conflict monitoring in criminal offenders: Interactive relations of psychopathy with anxiety and externalizing. *Journal of Abnormal Psychology*, 122, 797–806.
- Žukauskienė, R., Laurinavičius, A., & Čėsnienė, I. (2010). Testing factorial structure and validity of the PCL: SV in Lithuanian prison population. *Journal* of Psychopathology and Behavioral Assessment, 32, 363–372.
- Zwets, A. J., Hornsveld, R. H. J., Neumann, C. S., Muris, P., & van Marle, H. J. C. (2015). The four-factor model of the Psychopathy Checklist—Revised: Validation in a Dutch forensic inpatient sample. *International Journal of Law and Psychiatry*, 39, 13–22.

# CHAPTER 4

# The Response Modulation Hypothesis Formulation, Development, and Implications for Psychopathy

# RACHEL BENCIC HAMILTON JOSEPH P. NEWMAN

S ince the mid-20th century, public and clinical conceptualizations of psychopathy have centered on its affective component (Arrigo & Shipley, 2001). Frequently cited psychopathic deficits include poor fear conditioning (Birbaumer et al., 2005; Lykken, 1957), weak skin conductance responses in anticipation of aversive events (Hare, 1978; Hare & Quinn, 1971), poor passive avoidance learning (Blair et al., 2004; Newman & Kosson, 1986; Newman & Schmitt, 1998; Newman & Wallace, 1993), lack of startle potentiation while viewing unpleasant versus neutral pictures (Levenston, Patrick, Bradley, & Lang, 2000; Patrick, Bradley, & Lang, 1993), and abnormalities in brain activation in response to affective stimuli (Anderson & Kiehl, 2012; Blair, Mitchell, & Blair, 2005; Intrator et al., 1997). Accordingly, the callousness, remorselessness, and amorality seen in psychopathic individuals are attributed to an inherent emotional deficit (Blair et al., 2005; Kiehl & Hoffman, 2011). As such, psychopathy is traditionally characterized as a disorder of emotion (Buzina, 2012; Herpertz & Sass, 2000; Patrick, 1994, 2007).

Despite the significance of affective dysfunction in psychopathy, closer examination of psychopathic dysregulation points to broader information processing deficiencies. Indeed, in his pivotal work, The Mask of Sanity, Hervey Cleckley (1964) observed that "in complex matters of judgment involving ethical, emotional, and other evaluational factors . . . [the psychopath] shows no evidence of a defect. So long as the test is verbal or otherwise abstract, so long as he is not a direct participant, he shows that he knows his way about. . . . When the test of action comes to him we soon find ample evidence of his deficiency" (p. 346). The paradox of psychopathy is that psychopathic individuals show the capacity for intact reasoning and ostensibly genuine affect, but when they are engaged in goal-directed behavior, the information required for these activities is less accessible (Wallace, Schmitt, Vitale, & Newman, 2000). Attentionfocused models of psychopathy propose that psychopathic individuals are able to function normally when their attention is focused on affective or inhibitory information; it is when this information is outside their current focus of attention that psychopathic individuals display deficits (see Newman, 1998). In other words, decision making and emotional deficits seen in psychopathy can be viewed as being modulated by attentional focus.

The observation that psychopathic individuals fail to accommodate secondary or unattended information when engaged in goal-related activity spawned the development of cognitive theories of psychopathy (e.g., Newman, 1987). One of the most prominent cognitive models is the response modulation hypothesis (RMH). This perspective attributes the disinhibition seen in psychopathy to a failure to shift attention automatically from the implementation of ongoing goal-directed behavior to its evaluation (Newman, 1998; Patterson & Newman, 1993). We chronicle in this chapter the formation of the theory and outline the derivatives of this model. Our goal in the first section is to establish the context in which the model was developed, the principles of the theory, and its supporting evidence. In the second half of the review, we focus on the implications of informationprocessing abnormalities for the conceptualization of psychopathy and further explore potential mechanisms of cognitive dysfunction.

#### Origins of the RMH

In a review article published in 1980, Gorenstein and Newman outlined a potential explanation for what they termed "syndromes of disinhibition," or clinical conditions characterized by weak suppression of prepotent responses in the face of appetitive stimuli. Drawing parallels between the behavioral tendencies of animals with septal lesions and humans with disinhibitory psychopathology, the researchers proposed that dysfunction of the septo-hippocampal-orbitofrontal (SHF) system may serve as a functional analogue to syndromes of disinhibition. One of the chief deficits displayed by the lesioned animals was deficient response modulation (see Gray & McNaughton, 2000; McCleary, 1966). More specifically, animals with damage to the SHF exhibited response perseveration of the most dominant response in a given situation regardless of its consequences (McCleary, 1966). The behavior of animals with SHF lesions suggested that they failed to use nondominant information (i.e., environmental feedback) that contraindicated a dominant response during approach behavior (Gray & McNaughton, 2000).

As applied to human cognition, "response modulation" refers to the temporary interruption of a dominant response set and the simultaneous shift of attention from the effortful planning and execution of goal-directed behavior to its appraisal. Akin to rats with SHF lesions, individuals with response modulation deficits would be expected to fail to process peripheral cues calling for behavioral change in the midst of a dominant response, resulting in the subsequent failure to adapt to changing circumstances (Patterson & Newman, 1993). A deficit in response modulation would therefore contribute to the disinhibited expression of a dominant response set.

The proposal that the septal syndrome may represent a valid model of behavioral disinhibition and the observation of deficient response modulation in animals with SHF lesions led to the birth of the RMH of psychopathy. Specifically, Newman (1987) proposed that the fundamental deficit in psychopathy is the failure to accommodate information that is not part of a person's dominant response set (i.e., goal-directed focus of attention). Thus, deficient response modulation may serve as a mechanism for psychopathic disinhibition (Newman et al., in press; Patterson & Newman, 1993).

# Principles of the RMH

As noted, response modulation refers to the automatic direction of attention to information that is secondary to ongoing goal-directed behavior (Wallace, Vitale, & Newman, 1999). It triggers the effortful evaluation of current action and thus enables and initiates self-regulation (Newman & Wallace, 1993). According to the RMH, disinhibition characteristic of psychopathy results from a failure to stop and reflect on the potentially maladaptive nature of a given behavior. The response modulation mechanism can be broken down into four stages (see Figure 4.1). In the first stage, an individual engages in goal-directed behavior that is guided by a dominant response set, or a focus on appetitive motivational stimuli. The second stage transpires after the occurrence of a novel, unexpected, or aversive event (Patterson & Newman, 1993). This violation of expectations triggers an automatic "call for processing," or the devotion of attentional resources to process the disruption (see Siddle & Spinks, 1992). In addition, it generates an increase in arousal. In the third stage, nondisinhibited individuals answer the call to process the disruption and pause to reflect upon and evaluate the situation. The pause represents a relatively automatic shift in attention from the implementation of goal-directed action to its evaluation (Patternson & Newman, 1993). In this manner response modulation initiates higherorder cognitive processing that is essential for selfregulation (Norman & Shallice, 1986; Schneider, Dumais, & Shiffrin, 1982; Shiffrin & Schneider, 1977). However, disinhibited persons fail to pause



**FIGURE 4.1.** Stages of response modulation. When a novel, unexpected, or aversive event occurs during goal-directed behavior, nondisinhibited individuals respond to the call to process the disruption and switch their attentional focus to accommodate the feedback. Reflection on the feedback enables learning of the causal associations between a given behavior and its consequences to allow for adaptive responding in the future. Disinhibited individuals, however, fail to switch their attention from their dominant response set to the feedback, resulting in a failure of response modulation. The perseveration of the dominant response set, rather than the reflection on the consequences of an action contributes to a failure to learn causal associations between a behavior and a detrimental outcome, perpetuating the cycle of impulsive behavior.

and process the event, and consequently fail to use the feedback to modulate their behavior. Rather, they typically act in a disinhibited manner by perseverating on their dominant response set. The failure to consider secondary information disrupts the fourth stage, in which individuals form causal associations between their behavior and its consequences. The fourth stage is critical for translating prior experience into associated memories that can later be used to guide behavior (Patterson & Newman, 1993).

With regard to psychopathy, poor response modulation in our view can explain psychopathic individuals' apparent obliviousness to contextual cues, their consequent lack of self-regulatory functioning, and their affective deficiencies. Specifically, poor response modulation may cause psychopathic individuals to "less readily switch their attentional focus and motivational set to accommodate feedback" (Patterson & Newman, 1993, p. 721), thereby effectively ignoring the call for processing. Accordingly, in cases in which emotion and inhibitory cues are secondary to the primary focus of attention, these individuals would show characteristic deficits. In other words, the ability to automatically direct attention to and subsequently engage in the controlled processing of information peripheral to a current response set seems to occur less readily in psychopathic individuals (Wallace et al., 1999). Failure to answer the call for processing and to integrate and reflect on information likely contributes to a superficial (i.e., less elaborated) level of processing. This shallow processing in turn would disrupt the building of associative networks between actions and their consequences. This stage is critical for learning associations pertaining to outcomes; for example, that stealing is unlawful, that reacting aggressively out of anger is punishable, or that hurting another person causes distress. Failure to form these causal links would prevent an individual from considering the potentially maladaptive effects of an action and increase the likelihood that the person would reoffend, continue to act on impulses, and exhibit underdeveloped empathic abilities.

On the whole, the RMH posits an important set of mechanistic processes that translate into the symptoms and core features of the clinical condition of psychopathy when disrupted. These symptoms in turn map onto the two-factor model of psychopathy. Specifically, failure to reflect on the negative outcome of a maladaptive action encourages dysregulated and potentially asocial behavior. Moreover, failure to pause to evaluate the potential consequences of an action promotes impulsive action and prohibits the development of behavioral control, as well as a failure to devise a long-term life plan (Factor 2). The aforementioned unelaborated level of processing is likely to result in emotional poverty that limits the range and depth of feelings (i.e., shallow affect and diminished emotional reactivity), which in turn may contribute to a callous lack of concern for others and a general lack of remorse for harmful actions (Factor 1). In short, the RMH postulates a mechanism that critically influences the development of the interpersonal and affective deviations that high-psychopathic individuals exhibit, along with their lifestyle tendencies and proclivities toward antisocial behavior; in this way, the RMH seeks to account for the symptoms of psychopathy through a distinct, coherent process.

# Attentional Moderation of Psychopathic Deficits

#### Early Studies

The RMH predicts that the principal behavioral, cognitive, and affective correlates of psychopathy vary as a function of attentional focus (Newman & Baskin-Sommers, 2012). Early studies on attentional moderation of psychopathic individuals' information-processing deficits focused on passive avoidance learning tasks that call on participants to learn to inhibit a response in order to avert the occurrence of an aversive stimulus. Psychopathic individuals are notorious for failing to modify maladaptive behaviors and to inhibit punished responses (Blair, 2001; Hare, 1965; Lykken, 1957). While this pattern may be indicative of a lack of fear or inadequate motivation to avoid punish-

ment, it may also reflect an information-processing deficit that hinders the automatic shift to processing incidental information (e.g., as described by Patterson & Newman, 1993). To test the hypothesis that psychopathic individuals are able to use punishment cues effectively when it does not require the alteration of a dominant response set, Newman and Kosson (1986) devised a computerized passive avoidance task that manipulated the presence of a reward contingency. In the task, participants were required to learn which two-digit numbers were "target" numbers and which were "nontarget" numbers, so that they could respond to targets and withhold responses to nontargets. In one condition, participants won money for correct button press responses; this condition made actively pressing buttons to win rewards the dominant response set and passively avoiding making incorrect responses secondary. In the other condition, participants lost money for incorrect responses; this condition made avoidance of incorrect responses part of the dominant response set. In the reward condition, psychopathic participants made significantly more commission errors than nonpsychopathic individuals. In other words, they failed to inhibit their prepotent response to the presented numbers. However, psychopathic and nonpsychopathic participants performed similarly in the punishment-only condition. In short, if avoiding punishment was part of the dominant response set, psychopathic individuals performed similarly to nonpsychopaths. However, when information was incongruent with their goal-directed behavior and required the alteration of a response set (i.e., from reward focus to punishment focus), psychopathic individuals failed to accommodate the information and modify their behavior (see also Newman & Lorenz, 2003; Newman, Patterson, Howland, & Nichols, 1990; Newman, Patterson, & Kosson, 1987; Newman & Schmitt, 1998).

The RMH does not predict that psychopathic individuals are unable to process secondary cues; on the contrary, if permitted enough time to reflect on the consequences of a behavior, the information-processing deficits seen in psychopathy disappear; that is, if allotted sufficient time to process all aspects of a presented stimulus or to reflect on task performance, psychopathic individuals process and make use of less salient information (Patterson, Kosson, & Newman, 1987; Patterson & Newman, 1993). For instance, Newman and colleagues (1990) conducted a study in which participants performed a go/no-go passive avoidance task like the one we described earlier that provided feedback after each trial. Participants could take up to 5 seconds to process the feedback before pressing a button to continue on to the next trial. Results indicated that the longer participants paused after receiving negative feedback compared to positive feedback, the fewer incorrect responses they made. Moreover, psychopathic participants tended to pause less and therefore not fully process negative feedback after punished responses relative to their nonpsychopathic counterparts. However, if psychopathic individuals are given more time (e.g., through longer intertrial intervals) or are forced to reflect upon feedback, processing deficits relative to control participants are not observed (Arnett, Smith, & Newman, 1997; Newman et al., 1987). These findings suggest that psychopathic individuals have difficulty engaging in controlled processing of information that is not central to their dominant response set unless they are in situations that promote the processing of both primary and secondary cues (Wallace et al., 2000).

#### Evidence from Emotion Tasks

Critically, the RMH suggests that psychopathic individuals' emotional deficits are moderated by attention. Accordingly, the model indicates that psychopathy does not involve an inability to react emotionally but that an attention-related deficit undermines the elaboration of peripheral information, including fear stimuli. Newman, Curtin, Bertsch, and Baskin-Sommers (2010) recently conducted a study in which incarcerated male offenders with varying levels of psychopathy took part in a fear-conditioning paradigm designed to assess the specificity of psychopaths' fearlessness. During the experiment, participants viewed a series of letter cues. Letter cues were either upperor lowercase, and were colored red or green. Participants were told that in all conditions, electric shocks might be administered on some trials following a red letter (threat) but never after a green letter (no-threat). In one condition, participants were asked to indicate whether letters indicated threat (red) or no-threat (green) by pressing one of two buttons on each trial; this condition was designed to focus participants' attention directly on fear-related information. In the alternative-focus condition, participants were required to indicate whether letters were upper- or lowercase. In this condition, threat processing was not primary to the task of case discrimination; accordingly, this information was peripheral to the dominant response set. In each of the two task conditions, an index of fear activation, termed "fear-potentiated startle," was computed as the difference in average magnitude of blink response to noise probes occurring during threat as compared to no-threat presentations. As predicted, high-psychopathy participants showed significantly less fear-potentiated startle than low-psychopathy participants in the alternative-focus condition when the processing of threat cues was not explicitly part of the task. However, when forced to attend to the threat cues, high and low psychopathy individuals displayed comparable startle responses (see also Baskin-Sommers, Curtin, & Newman, 2013).

A similar pattern is evident in neural and psychophysiological correlates of psychopathy: when emotion is peripheral to a task, psychopathic individuals show abnormalities in amygdala activation (Larson et al., 2013) and in attention-related physiological responses (Baskin-Sommers et al., 2011; Sadeh & Verona, 2012) to threat-relevant stimuli. However, when attention is directed toward emotional stimuli, physiological reactivity differences are not observed. These findings suggest that the diminished reactivity to fear stimuli and affective cues seen in psychopathic individuals reflects idiosyncrasies in attention that limit the processing of information that is outside of the attentional spotlight (Newman et al., 2010).

Further support for the influence of attention on affective processing in psychopathy comes from tasks that assess emotion facilitation. Customarily, nonpsychopathic individuals demonstrate emotion facilitation on affective lexical decision tasks; that is, they identify and respond to emotional words more quickly than to words of neutral valence (see Öhman, Flykt, & Esteves, 2001; Strauss, 1983). However, relative to nonpsychopathic individuals, psychopathic participants display less emotion facilitation during lexical decision tasks (Reidy, Zeichner, Hunnicutt-Ferguson, & Lilienfeld, 2008), in conjunction with abnormal event-related potential (ERP) responses to affective versus neutral words (Kiehl, Hare, McDonald, & Brink, 1999; Williamson, Harpur, & Hare, 1991). Lorenz and Newman (2002) argued that this pattern of task performance reflects poor response modulation, in that processing the affective valence of the words is secondary to processing their lexical status. They suggested that, since the lexical decision task required participants only to distinguish between words and nonwords, the high-psychopathic participants did not attend to emotional valence and therefore failed to reallocate attention to elaborate on the emotional content of stimuli. Consequently, they responded to all cues similarly. The alleged paradox of psychopaths' performance is that when asked to turn their attention to processing and appraising the valence of emotion cues, and given enough time to do so, their performance is comparable to that of nonpsychopaths (Lorenz & Newman, 2002; see also Glass & Newman, 2009).

Meffert, Gazzola, den Boer, Bartels, and Keysers (2013) presented evidence that higher-order cognitive processes moderate the empathic deficits of psychopathic individuals. In their study, participants viewed short movie clips of two people's hands interacting with each other several times while in a functional magnetic resonance imaging (fMRI) scanner. The way in which one hand touched the other varied by each clip to express love, pain, social rejection, or a neutral feeling. For the first viewing, participants were told to watch the clips in the same manner that they would watch their favorite movies. The second time participants watched the clips, they were told to empathize with the actors and try to feel what they were feeling. In the final portion of the study, researchers performed similar hand interactions with the participants themselves. The purpose of these conditions was to evaluate the extent to which psychopathic individuals' mirror neuron systems were activated when viewing an affective interaction, when empathizing with the actor involved in the observed affective interaction, and when engaging in an affective interaction. When asked simply to observe the films, psychopathic individuals demonstrated significantly less mirror system activation than did nonpsychopathic individuals. However, when asked to empathize with the actors, differences between the groups were not evident. Meffert and colleagues suggested that when psychopathic individuals deliberately attend to empathy-related cues, they show normal empathy-related responses. It is only in situations in which the processing of empathy-related information is incidental that they show abnormalities. In our view, these findings provide evidence that the interpersonal and affective deficits characteristic of psychopathy are turned on or off depending on attentional focus (see also Ayame et al., 2014).

#### Evidence from Affectively Neutral Tasks

A key prediction of the RMH is that psychopathic individuals' information-processing deficits will not be specific to affective cues; rather, they should arise whenever the processing of peripheral information relies on automatic shifts of attention. Thus, psychopathic individuals will show abnor-

malities in performance on tasks that do not involve reward contingencies or emotional stimuli. In flanker and Stroop tasks, psychopathic individuals are significantly less affected by response-incongruent information relative to nonpsychopathic individuals when this information is outside the attentional spotlight (e.g., Hamilton, Baskin-Sommers, & Newman, 2014; Hiatt, Schmitt, & Newman, 2004; Newman, Schmitt, & Voss, 1997; Vitale, Brinkley, Hiatt, & Newman, 2007; Vitale et al., 2005). For example, Zeier, Maxwell, and Newman (2009) had psychopathic and nonpsychopathic inmates complete a flanker-type task in which two stimuli that were congruent (both stimuli are letters or numbers), incongruent (one letter, one number), or control (letter/number and asterisk) flanked a central arrow that pointed to the location of a target. The target location was either cued or not cued at the beginning of the trial. Researchers found that psychopathic participants showed significantly less interference on cued trials when they were able to focus their attention on the target location prior to the presentation of the stimuli. On trials that did not cue a prepotent focus of attention, psychopathic individuals showed comparable interference to controls (see also Zeier & Newman, 2013). In other words, psychopathic participants displayed interference comparable to that of controls in the no-cue condition in which both stimuli were attended, whereas they appeared uninfluenced by peripheral nontarget information in the cued condition in which they only attended to the prepotent goal-related information.

Psychopathic individuals' apparent insensitivity to conflict-related information can be understood as a failure to reallocate attention to, and therefore process, the conflict. Wolf and colleagues (2012) assessed conflict processing in psychopathy using the attentional blink task. As a canonical measure of selective attention, this paradigm provides a means for examining the processing of temporally separated but spatially equivalent distracting stimuli versus task-relevant stimuli. In the task, a sequence of visual stimuli is presented in rapid succession at the same spatial location on a screen. The stimulus stream comprises two targets along with numerous distractors, and the second target (T2) temporally "lags" behind the first (T1). Typically, participants fail to detect the subsequent T2 if it is presented between 100 and 600 milliseconds after onset of the T1 (Raymond, Shapiro, & Arnell, 1992). Based on the assumption that the attentional blink represents the conflict between the consolidation of T1 and the reallocation of attention to the distractor that follows T1 (see Nieuwenstein & Potter, 2006), Wolf and colleagues (2012) predicted that psychopathic individuals would allocate less attention to distractors, thus encountering less conflict and showing a smaller attentional blink. Data were consistent with this prediction: Psychopathic participants had better T2 accuracy during the blink interval than nonpsychopathic individuals. This outcome supports the notion that psychopathy is characterized by general information-processing abnormalities involving attentional dysfunction.

## **Specifying Models and Mechanism**

Thus far, the terms "model" and "mechanism" have not been defined. The following sections use both terms interchangeably, while acknowledging that these words are not synonymous. Psychological models aim to explain mental phenomena by providing conceptual representations of those phenomena. They serve as interpretative theoretical frameworks, acting as general hypotheses regarding the nature of specific phenomena for the purposes of comprehension and prediction (Bailer-Jones, 2009; Giere, 2004). Models can be either empirical (i.e., based on observable data) or mechanistic (Tham, 2000). The term "mechanism" refers to a complex system, analogous to a machine, that comprises numerous parts. In the case of psychology, these entities are mental processes. The mechanistic entities interact to produce a behavior (Glennan, 1996). According to Machamer, Darden, and Craver (2000), mechanisms have a set of stable properties, are detectable by a variety of methods, and are able to be manipulated. Mechanistic models depict the causal interactions among mechanisms' parts that enable these parts to produce the phenomena under various conditions. Good models specify the boundary conditions for a mechanism (i.e., the beginning and termination conditions) and how the mechanism behaves upon intervention (Weiskopf, 2011). The following interpretations of the RMH represent both models and mechanisms. It is important to note, however, that the following proposals are not mutually exclusive.

## The Attention Bottleneck: Specifying the Mechanism of RMH

In recent years, researchers have presented empirical evidence that helps to specify further the cognitive mechanisms underlying poor response modulation in psychopathic individuals. Specifically, evidence exists for an attention bottleneck (AB) mechanism for abnormalities in early selective attention and deficits in response modulation observed in psychopathy. The hypothesized mechanism consists of an early constraint on attentional processing that precludes the processing of information unrelated to a dominant response set (Baskin-Sommers et al., 2011; Newman & Baskin-Sommers, 2012).

Selective attention modulates information processing at multiple overlapping stages (Luck & Hillyard, 2000; Luck, Woodman, & Vogel, 2000).<sup>1</sup> An early stage of selection entails the preattentive filtering of stimuli according to basic sensory characteristics, such as location, orientation, or color, rather than stimulus identification (Broadbent, 1982; Driver, 2001; Johnston & Dark, 1986; Kahneman & Treisman, 1984; Kenemans, Smulders, & Kok, 1995; Pashler, 1998; Wijers, Mulder, Okita, Mulder, & Scheffers, 1989). This stage allows for reduced processing of distracting task-irrelevant information at an early perceptual processing stage (Itti, 2005; Sabri et al., 2013) and occurs in situations in which sensory systems are overloaded (i.e., high perceptual load). In contrast to early selection, late selection "operates only after semantic identification and is primarily concerned with what decisions to make and what responses to produce, not with what sensory input to analyze and identify" (Huang-Pollock, Carr, & Nigg, 2002, p. 363). Late selection influences memory or response processes rather than sensory processes (Luck et al., 2000) and involves stimulus categorization based on additional processing of physical, functional, or semantic features (Alperin et al., 2013). This late selection mechanism further involves high-order regulatory processes (i.e., cognitive control) to resolve interference from perceived distractors and to maintain a goal-related focus of attention (Lavie, Hirst, de Fockert, & Viding, 2004).

With regard to psychopathy, dysfunction at the early stage of selection appears to create a bottleneck; psychopathic individuals appear to be less sensitive to information that is peripheral to their preestablished attentional focus (Baskin-Sommers & Newman, 2013). Abnormalities in selective attention may limit the range of information that can be processed, thus filtering out information incongruent with current processing priorities. In this way, the AB in psychopathy may effectively eliminate the processing of task-irrelevant information regardless of salience and prohibit the conscious processing of these cues during goal-directed behavior. Consequently, once the bottleneck is established via focused attention, psychopathic individuals remain oblivious to peripheral cues and do not use them to regulate behavioral responses (Newman & Baskin-Sommers, 2012).

Figure 4.2 provides an illustration of the AB and contrasts it with normal early selection seen in nonpsychopathic individuals. Due to the fact that limitless information exists in the environment, humans are physically unable to perceive and process all external sensory stimuli. As a result, selective attention is necessary to maintain coherent cognitive functioning and prioritize goal-related information above potentially interfering distractors (Posner, 2012; Serences, 2011). In psychopathy, the engagement of attention establishes the bottleneck, which disrupts the processing of information that is inconsistent with the top-down focus of attention. When affective or inhibitory information is not the main focus of attention, it is not fully processed and consequently has little impact on behavior. The failure to integrate inhibitory, affective, and conflict cues outside the current focus of attention ultimately results in the disinhibited expression of dominant goal-directed responses. The lighter color of the bottleneck in Figure 4.2 for nonpsychopathic individuals illustrates how attention can be captured by salient stimuli. In contrast, the dark lines comprising psychopathic individuals' narrower bottleneck are meant to depict how their attention is less susceptible to bottom-up influences.



**FIGURE 4.2.** Illustrative representation of the attention bottleneck in psychopathy. The shapes at the top of the diagram represent the limitless amount of information in the environment. Due to limitations in cognitive capacity, humans are physically unable to perceive and process all external sensory stimuli. Selective attention enables the selective processing of task-relevant information to the exclusion of less important information; thus, it is critical for the maintenance of coherent cognitive function and the prioritization of goal-related information over potentially interfering distractors. In psychopathy, the engagement of attention establishes the bottleneck, which disrupts the processing of information that is inconsistent with the top-down focus of attention. The narrowed bottom section in the psychopathy depiction on the left shows how the bottleneck hinders the processing of task-irrelevant information is not the main focus of attention, such information is not fully processed and consequently has little impact on behavior. The failure to integrate inhibitory, affective, and conflict cues outside the current focus of attention ultimately gives rise to the disinhibited expression of dominant goal-directed responses. Moreover, the contrast of the light and dark bottleneck colors represents the ability for attention to be captured by salient stimuli versus a relatively impermeability to bottom-up influences.
# Conceptualization of Psychopathic Traits: The AB Perspective

The AB perspective conceptualizes psychopathic individuals' self-regulatory deficits as an impaired ability to accommodate peripheral bottom-up information during goal-directed behavior (Newman & Baskin-Sommers, 2012). This model views the core affective and behavioral characteristics of psychopathy as the result of an AB that biases processing toward information related to the immediate focus of attention, whether it be goal-directed or stimulus-driven, to the exclusion of other information. The bottleneck fosters a sequential processing style (Bencic & Newman, 2014) that contributes to the preferential processing of set-relevant information. Unless threat or punishment cues and other salient information are directly related to this established attentional set, this information will fail to modulate behavior (e.g., Baskin-Sommers et al., 2011; Baskin-Sommers, Curtin, & Newman, 2013). In this way, the bottleneck facilitates the "self-centered propensity to take advantage of others and to act on one's impulses whenever deemed convenient" (Lilienfeld & Widows, 2005, p. 56). From this perspective, psychopathic individuals would be expected to show dysregulated behavior when peripheral information consists of cues for threat, others' distress, or future aversive consequences, or cues calling for self-reflection. Specifically, failure to shift attention to the processing of fear- or distress-related information would result in callous egocentricity and a lack of perspective taking (e.g., Decety & Lamm, 2006; Meltzoff & Brooks, 2001). Even if this information is registered by the individual, he or she is unlikely to elaborate upon it, due to the unavailability of attentional resources (see Baskin-Sommers et al., 2013). Moreover, even if he or she did attend to this information, the normal associative network for these cues is likely to be impoverished (Hamilton, Hiatt Racer, & Newman, 2015). Failure to consider the potential consequences of a given action would encourage an individual to act on his or her prepotent responses, promoting impulsivity. Furthermore, if an individual has antisocial tendencies, impermeability of attentional focus to the potential consequences of a given action would result in inadequately motivated delinquency. Finally, failure to shift attention to reflect on the self and one's past experiences and failures would result in what Cleckley characterized as "poor judgment and failure to learn by experience" (1964, p. 338).

# Neural Mechanisms of Attentional Dysfunction

To date, a specific neurobiological substrate for abnormal selective attention in psychopathy has yet to be established. Gorenstein and Newman (1980) conceptualized deficient response modulation as a "septal syndrome," based on the overlap between behavior-based deficits in people with disinhibitory psychopathology and corresponding deficits in animals with lesions of the SHF system. While this system represents a potential substrate for abnormalities in attention and orienting in psychopathy, Newman and colleagues (1997) have not further developed the neural basis of the RMH model (however, see Gray & McNaughton, 2000). We review in the following sections two compatible neural perspectives that account for response modulation deficits in psychopathy in terms of brain abnormalities that disrupt the balance between top-down and bottom-up influences on behavior.

#### **Context-Appropriate Balance of Attention**

MacCoon, Wallace, and Newman (2004) outlined the context-appropriate balance of attention (CABA) framework to clarify the RMH and explain dysregulation associated with psychopathy in neural network terms. In neural network models, thoughts, emotions, and actions are represented as networks of coactivated neurons (see also Aparicio & Levine, 1994; Galushkin, 2007). The level of network activation dictates which cognitions, emotions, and behaviors are most dominant, such that the most activated network represents the dominant response, and lesser-activated networks represent alternative responses (Banquet, Smith, & Guenther, 1992). In some cases, the dominant response is not the most adaptive response within a given situation. However, selective attention can be used to make a less-activated network dominant and to suppress dominant network activation in a top-down manner if the less-activated network is more adaptive based on the context. The effortful deployment of cognitive resources to suppress a dominant response in favor of a more adaptive alternative response is critical for behavioral regulation. For instance, an individual's prepotent response to being cut off by another driver on the freeway may be to yell profanities, but this response is less appropriate in the context of a car full of children. In this case, attentional resources must be utilized to suppress the dominant response and activate the alternative response of relaxed deep breathing. Self-regulation therefore requires the context-appropriate allocation of cognitive resources (MacCoon et al., 2004).

The CABA model proposes that failures of response modulation represent the failure to shift attention to nondominant cues to modify a maladaptive dominant response. Dysregulation in psychopathy can be understood as a deficit in modulating top-down attentional focus in response to nondominant information. Specifically, psychopathy can be viewed as entailing decreased bottom-up activation in response to nondominant cues even when these cues are important. This lack of activation results in a failure to attend to these cues and to less-activated neural networks, impairing the CABA and self-regulatory processes (MacCoon et al., 2004).

#### Impaired Integration

Recently, Hamilton and colleagues (2015) proposed the impaired integration (II) theory of psychopathy, a preliminary brain-based framework that attempts to integrate emotion and attentionfocused models of psychopathy. Drawing on neuroimaging data indicating the diffuse nature of brain abnormalities in psychopathy (e.g., Blair, 2012; Kiehl, 2006; Koenigs, Baskin-Sommers, Zeier, & Newman, 2011; Motzkin, Newman, Kiehl, & Koenigs, 2011; Yang et al., 2012), along with the notion that "psychopathic individuals may be 'wired up' differently" than nonpsychopaths (Hare, Williamson, & Harpur, 1988, p. 87), the authors suggest that emotion processing and response modulation deficits in psychopathy can be understood within a broader framework predicated on the assumption that psychopathy involves deficits in integrating multicomponent information. Specifically, Hamilton and colleagues (2015) argue that the information-processing deficiencies in psychopathy may not stem from isolated structural abnormalities or deficient functioning of a single brain region, but instead might relate to dysfunctional connectivity within and between neural systems. According to II theory, there is no single structure or system responsible for the clinical condition of psychopathy; instead, abnormalities in task performance may relate to deficient coordination in broad activated circuitry.

Hamilton and colleagues (2015) suggest that abnormal connectivity may establish conditions for the AB by impairing the ability to rapidly integrate brain activity related to primary and peripheral information, as well as limiting the breadth of spontaneous associative activation. This bottleneck may encourage sequential processing that limits the ability to rapidly process multidimensional or perceptually complex stimuli, even if these stimuli are task-relevant. In short, the II model attributes psychopathic dysfunction to "an insufficiency of active integrative processes [which causes psychopathic individuals to remain] oblivious to the drawbacks or complications that would give another pause and might otherwise give [them] pause as well" (Shapiro, 1965, p. 149).

# Conclusion

The RMH represents a prominent cognitive theory of psychopathy that has made important contributions to clarifying the bases of this clinical condition. By offering a broad perspective on psychopathy that complements emotion-centric models, it offers unique insights that have important implications for treatment of psychopathy. Perhaps the most innovative feature of the RMH is that information-processing abnormalities are purported to influence the processing of both emotional stimuli and affectively neutral stimuli; thus, the model is not specific to affectively significant information. Moreover, the RMH presumes that commonly cited emotional deficits in psychopathy can be eliminated by manipulating the focus of attention.

Modern formulations (Hamilton et al., 2015; Newman & Baskin-Sommers, 2012; MacCoon et al., 2004) have enhanced the clarity and predictive utility of the original RMH to provide an improved theoretical and mechanistic account of the poor response modulation observed in psychopathy. However, further research is needed to refine the AB perspective on deficient response modulation in psychopathy, including elucidation of its neurobiological substrates. Additionally, studies should be conducted to evaluate how attentional abnormalities influence cognitive style in psychopathy, and to test hypotheses regarding the sequential nature of psychopathic individuals' deviant information-processing orientation (Hamilton et al., 2015). Given the developmental nature of psychopathic personality, research is also needed to clarify whether abnormalities in neural function give rise to the proposed AB and related cognitive anomalies in psychopathy, or if instead the AB precedes and contributes to abnormalities in brain function.

In summary, the RMH has made important contributions to the field of psychopathy since its development 30 years ago. It represents a generative and testable model that parsimoniously characterizes the classic clinical condition of psychopathy. We look forward to continuing research by investigators in the field on the RMH model and its implications for prevention and remediation (e.g., Baskin-Sommers, Curtin, & Newman, 2015) of this intriguing and important form of psychopathology.

#### NOTE

 While the current discussion makes the distinction between early and late-stage processes of selective attention, research shows that these processes are on a continuum; early and late processes combine to exert an interactive influence on information processing (Luck & Hillyard, 1995).

#### REFERENCES

- Alperin, B. R., Haring, A. E., Zhuravleva, T. Y., Holcomb, P. J., Rentz, D. M., & Daffner, K. R. (2013). The dissociation between early and late selection in older adults. *Journal of Cognitive Neuroscience*, 25, 2189–2206.
- Anderson, N. E., & Kiehl, K. A. (2012). The psychopath magnetized: Insights from brain imaging. *Trends in Cognitive Sciences*, 16, 52–60.
- Aparicio, M., IV, & Levine, D. S. (1994). Why are neural networks relevant to higher cognitive function? In M. Aparicio, IV & D. S. Levine (Eds.), Neural networks for knowledge representation and inference (pp. 1–26). Hillsdale, NJ: Erlbaum.
- Arnett, P. A., Smith, S. S., & Newman, J. P. (1997). Approach and avoidance motivation in psychopathic criminal offenders during passive avoidance. *Journal of Personality and Social Psychology*, 72(6), 1413–1428.
- Arrigo, B. A., & Shipley, S. (2001). The confusion over psychopathy (I): Historical considerations. International Journal of Offender Therapy and Comparative Criminology, 45, 325–344.
- Ayame, T., Keiji, T., Yoshinori, S., Jun, M., Yoshitake, T., & Keisuke, T. (2014). Moderation of the relationship between psychopathy and empathy by attention [Abstract]. Personality and Individual Differences, 60, S62.
- Bailer-Jones, D. (2009). Scientific models in philosophy of science. Pittsburgh, PA: University of Pittsburgh Press.
- Banquet, J. P., Smith, M., & Guenther, W. (1992). Topdown processes, attention, and motivation in cognitive tasks. In D. S. Levine & S. J. Levine (Eds.), Motivation, emotion, and goal direction in neural networks (pp. 169–208). New York: Psychology Press.

- Baskin-Sommers, A., Curtin, J. J., Li, W., & Newman, J. P. (2011). Psychopathy-related differences in selective attention are captured by an early event-related potential. Personality Disorders: Theory, Research and Treatment, 3, 370–378.
- Baskin-Sommers, A. R., Curtin, J. J., & Newman, J. P. (2013). Emotion-modulated startle in psychopathy: Clarifying familiar effects. *Journal of Abnormal Psy*chology, 122, 458–468.
- Baskin-Sommers, A., Curtin, J. J., & Newman, J. P. (2015). Altering the cognitive–affective dysfunctions of psychopathic and externalizing offender subtypes with cognitive remediation. *Clinical Psychological Science*, 3, 45–57.
- Baskin-Sommers, A. R., & Newman, J. P. (2013). Differentiating the cognition-emotion interactions that characterize psychopathy versus externalizing disorders. In M. D. Robinson, E. R. Watkins, & E. Harmon-Jones (Eds.), *Handbook of cognition and emotion* (pp. 501–520). New York: Guilford Press.
- Bencic, R. K., & Newman, J. P. (2014, September). Information processing effects of the attention bottleneck in psychopathy: Evidence from the simultaneous-sequential paradigm. Poster presented at the annual meeting of the Society for Research on Psychopathology, Evanston, IL.
- Birbaumer, N., Veit, R., Lotze, M., Erb, M., Hermann, C., Grodd, W., & Flor, H. (2005). Deficient fear conditioning in psychopathy: A functional magnetic resonance imaging study. Archives of General Psychiatry, 62, 799–805.
- Blair, R. J. R. (2001). Neurocognitive models of aggression, the antisocial personality disorders, and psychopathy. *Journal of Neurology, Neurosurgery, and Psychiatry*, 71, 727–731.
- Blair, R. J. R. (2012). Cortical thinning and functional connectivity in psychopathy. American Journal of Psychiatry, 169, 684–687.
- Blair, R. J. R., Mitchell, D., & Blair, K. (2005). The psychopath: Emotion and the brain. New York: Blackwell.
- Blair, R. J. R., Mitchell, D. G. V., Leonard, A., Budhani, S., Peschardt, K. S., & Newman, C. (2004). Passive avoidance learning in individuals with psychopathy: Modulation by reward but not by punishment. *Per*sonality and Individual Differences, 37, 1179–1192.
- Broadbent, D. (1982) Task combination and selective intake of information. Acta Psychologica (Amsterdam), 50, 253–290.
- Buzina, N. (2012). Psychopathy—Historical controversies and new diagnostic approach. Psychiatria Danubina, 24, 134–142.
- Cleckley, H. (1964). *The mask of sanity* (4th ed.). St. Louis, MO: Mosby. (Original work published 1941)
- Decety, J., & Lamm, C. (2006). Human empathy through the lens of social neuroscience. *Scientific World Journal*, 6, 1146–1163.
- Driver, J. (2001). A selective review of selective attention research from the past century. *British Journal of Psychology*, 92, 53–78.

- Galushkin, A. I. (2007). Neural network theory. Berlin: Springer.
- Giere, R. N. (2004). How models are used to represent reality. *Philosophy of Science*, 71, 742–752.
- Glass, S. J., & Newman, J. P. (2009). Emotion processing in the criminal psychopath: The role of attention in emotion-facilitated memory. *Journal of Abnormal Psychology*, 118, 229–234.
- Glennan, S. S. (1996). Mechanisms and the nature of causation. Erkenntnis, 44, 49–71.
- Gorenstein, E. E., & Newman, J. P. (1980). Disinhibitory psychopathology: A new perspective and a model for research. *Psychological Review*, 87, 301–315.
- Gray, J. A., & McNaughton, N. (2000). The neuropsychology of anxiety: An enquiry into the function of the septo-hippocampal system (2nd ed.). Oxford, UK: Oxford University Press.
- Hamilton, R. K. B., Baskin-Sommers, A. R., & Newman, J. P. (2014). Relation of frontal N100 to psychopathy-related differences in selective attention. *Biological Psychology*, 103, 107–116.
- Hamilton, R. K. B., Hiatt Racer, K., & Newman, J. P. (2015). Impaired integration in psychopathy: Bridging affective and cognitive models. *Psychological Re*view, 122, 770–791.
- Hare, R. D. (1965). Acquisition and generalization of a conditioned-fear response in psychopathic and nonpsychopathic criminals. *Journal of Psychology*, 59, 367–370.
- Hare, R. D. (1978). Electrodermal and cardiovascular correlates of psychopathy. In R. D. Hare & D. Schalling (Eds.), *Psychopathic behavior: Approaches to research* (pp. 107–143). Chichester, UK: Wiley.
- Hare, R. D., & Quinn, M. J. (1971). Psychopathy and autonomic conditioning. *Journal of Abnormal Psy*chology, 77, 223–235.
- Hare, R. D., Williamson, S. E., & Harpur, T. J. (1988), Psychopathy and language. In T. E. Moffitt & S. A. Mednick (Eds.), *Biological contributions to crime causation* (pp. 68–92). Dordrecht, The Netherlands: Martinus Nijhoff.
- Herpertz, S. C., & Sass, H. (2000). Emotional deficiency and psychopathy. Behavioral Sciences and the Law, 18, 567–580.
- Hiatt, K. D., Schmitt, W. A., & Newman, J. P. (2004). Stroop tasks reveal abnormal selective attention in psychopathic offenders. *Neuropsychology*, 18, 50–59.
- Huang-Pollock, C. L., Carr, T. H., & Nigg, J. T. (2002). Development of selective attention: Perceptual load influences early versus late attentional selection in children and adults. *Developmental Psychology*, 38, 363–375.
- Intrator, J., Hare, R., Stritzke, P., Brichtswein, K., Dorfman, D., Harpur, T., et al. (1997). A brain imaging (single photon emission computerized tomography) study of semantic and affective processing in psychopaths. *Biological Psychiatry*, 42, 96–103.
- Itti, L. (2005). Models of bottom-up attention and saliency. In L. Itti, G. Rees, & J. Tsotsos (Eds.), Neu-

robiology of attention (pp. 576–582). San Diego, CA: Academic Press.

- Johnston, W. A., & Dark, V. J. (1986). Selective attention. Annual Review of Psychology, 37, 43–75.
- Kahneman, D., & Treisman, A. (1984). Changing views of attention and automaticity. In R. Parasuraman & D. R. Davis (Eds.), Varieties of attention (pp. 29–61). Orlando, FL: Academic Press.
- Kenemans, J. L., Smulders, F. T., & Kok, A. (1995). Selective processing of two-dimensional visual stimuli in young and old subjects: Electrophysiological analysis. *Psychophysiology*, 32, 108–120.
- Kiehl, K. A. (2006). A cognitive neuroscience perspective on psychopathy: Evidence for paralimbic system dysfunction. *Psychiatry Research*, 142, 107–128.
- Kiehl, K. A., Hare, R. D., McDonald, J. J., & Brink, J. (1999). Semantic and affective processing in psychopaths: An event-related potential (ERP) study. Psychophysiology, 36, 765–774.
- Kiehl, K. A., & Hoffman, M. B. (2011). The criminal psychopath: History, neuroscience, treatment, and economics. Jurimetrics, 51, 355–397.
- Koenigs, M., Baskin-Sommers, A., Zeier, J., & Newman, J. P. (2011). Investigating the neural correlates of psychopathy: A critical review. *Molecular Psychiatry*, 16, 792–799.
- Larson, C. L., Baskin-Sommers, A. R., Stout, D. M., Balderston, N. L., Curtin, J. J., Schultz, D. H., et al. (2013). The interplay of attention and emotion: Top-down attention modulates amygdala activation in psychopathy. Cognitive, Affective, and Behavioral Neuroscience, 13, 757–770.
- Lavie, N., Hirst, A., de Fockert, J. W., & Viding, E. (2004). Load theory of selective attention and cognitive control. *Journal of Experimental Psychology: General*, 133, 339–354.
- Levenston, G. K., Patrick, C. J., Bradley, M. M., & Lang, P. J. (2000). The psychopath as observer: Emotion and attention in picture processing. *Journal of Abnormal Psychology*, 109, 373–385.
- Lilienfeld, S. O., & Widows, M. (2005). Psychopathic Personality Inventory—Revised professional manual. Odessa, FL: Psychological Assessment Resources.
- Lorenz, A. R., & Newman, J. P. (2002). Deficient response modulation and emotion processing in lowanxious Caucasian psychopathic offenders: Results from a lexical decision task. *Emotion*, 2, 91–104.
- Luck, S. J., & Hillyard, S. A. (2000). The operation of selective attention at multiple stages of processing: Evidence from human and monkey electrophysiology. In M. S. Gazzaniga (Ed.), *The new cognitive neurosciences* (2nd ed., pp. 687–700). Cambridge, MA: MIT Press.
- Luck, S. J., & Hillyard, S. A. H. (1995). The role of attention in feature detection and conjunction discrimination: An electrophysiological analysis. *International Journal of Neuroscience*, 80, 281–297.
- Luck, S. J., Woodman, G. F., & Vogel, E. K. (2000). Event-related potential studies of attention. *Trends in Cognitive Sciences*, 4, 432–440.

- Lykken, D. T. (1957). A study of anxiety in the sociopathic personality. *Journal of Abnormal and Social Psychology*, 55, 6–10.
- MacCoon, D. G., Wallace, J. F., & Newman, J. P. (2004). Self-regulation: The context-appropriate allocation of attentional capacity to dominant and non-dominant cues. In R. F. Baumeister & K. D. Vohs (Eds.), Handbook of self-regulation: Research, theory, and applications (pp. 422–446). New York: Guilford Press.
- Machamer, P., Darden, L., & Craver, C. F. (2000). Thinking about mechanisms. *Philosophy of Science*, 67, 1–25.
- McCleary, R. A. (1966). Response-modulating function of the limbic system: Initiation and suppression. In E. Stellar & J. M. Sprague (Eds.), *Progress in physiological psychology* (Vol. 1, pp. 209–271). New York: Plenum Press.
- Meffert, H., Gazzola, V., den Boer, J. A., Bartels, A. A., & Keysers, C. (2013). Reduced spontaneous but relatively normal deliberate vicarious representations in psychopathy. *Brain*, 136, 2550–2562.
- Meltzoff, A. N., & Brooks, R. (2001). "Like Me" as a building block for understanding other minds: Bodily acts, attention, and intention. In B. F. Malle, L. J. Moses, & D. A. Baldwin (Eds.), *Intentions and intentionality: Foundations of social cognition* (pp. 171–191). Cambridge, MA: MIT Press.
- Motzkin, J. C., Newman, J. P., Kiehl, K. A., & Koenigs, M. (2011). Reduced prefrontal connectivity in psychopathy. *Journal of Neuroscience*, 31, 17348–17357.
- Newman, J. P. (1987). Reaction to punishment in extraverts and psychopaths: Implications for the impulsive behavior of disinhibited individuals. *Journal of Research in Personality*, 21, 464–485.
- Newman, J. P. (1998). Psychopathic behavior: An information processing perspective. In D. J. Cooke, R. D. Hare, & A. Forth (Eds.), Psychopathy: Theory, research and implications for society (pp. 81–104). Dordrecht: The Netherlands: Kluwer Academic.
- Newman, J. P., & Baskin-Sommers, A. R. (2012). Early selective attention abnormalities in psychopathy: Implications for self-regulation. In M. I. Posner (Ed.), *Cognitive neuroscience of attention* (2nd ed., pp. 421– 440). New York: Guilford Press.
- Newman, J. P., Curtin, J. J., Bertsch, J. D., & Baskin-Sommers, A. R. (2010). Attention moderates the fearlessness of psychopathic offenders. *Biological Psychiatry*, 67, 66–70.
- Newman, J. P., & Kosson, D. S. (1986). Passive avoidance learning in psychopathic and nonpsychopathic offenders. Journal of Abnormal Psychology, 95, 257–263.
- Newman, J. P., & Lorenz, A. R. (2003). Response modulation and emotion processing: Implications for psychopathy and other dysregulatory psychopathology. In R. J. Davidson, K. Scherer, & H. H. Goldsmith (Eds.), *Handbook of affective sciences* (pp. 904–929). New York: Oxford University Press.
- Newman, J. P., MacCoon, D. G., Buckholtz, J., Bertsch, J., Hiatt, K. D., & Vaughn, L. J. (in press). Deficient

integration of top-down and bottom-up influences on attention in psychopaths: Potential contribution of the septal-hippocampal system. In D. Barch (Ed.), *Cognitive and affective neuroscience of psychopathology*. New York: Oxford University Press.

- Newman, J. P., Patterson, C. M., Howland, E. W., & Nichols, S. L. (1990). Passive avoidance in psychopaths: The effects of reward. *Personality and Individu*al Differences, 11, 1101–1114.
- Newman, J. P., Patterson, C. M., & Kosson, D. S. (1987). Response perseveration in psychopaths. *Journal of Abnormal Psychology*, 96, 145–148.
- Newman, J. P., & Schmitt, W. A. (1998). Passive avoidance in psychopathic offenders: A replication and extension. *Journal of Abnormal Psychology*, 107, 527–532.
- Newman, J. P., Schmitt, W. A., & Voss, W. (1997). The impact of motivationally neutral cues on psychopathic individuals: Assessing the generality of the response modulation hypothesis. *Journal of Abnormal Psychology*, 106, 563–575.
- Newman, J. P., & Wallace, J. F. (1993). Psychopathy and cognition. In K. S. Dobson & P. C. Kendall (Eds.), *Psychopathology and cognition* (pp. 293–349). San Diego, CA: Academic Press.
- Nieuwenstein, M. R., & Potter, M. C. (2006). Temporal limits of selection and memory encoding: A comparison of whole versus partial report in rapid serial visual presentation. *Psychological Science*, 17, 471–475.
- Norman, D. A., & Shallice, T. (1986). Attention to action: Willed and automatic control of behavior. In R. J. Davidson, G. E. Schwartz, & D. Shapiro (Eds.), Consciousness and self-regulation: Advances in research and theory (pp. 3–18). New York: Springer Science.
- Öhman, A., Flykt, A., & Esteves, F. (2001). Emotion drives attention: Detecting the snake in the grass. *Journal of Experimental Psychology: General, 130*, 466–478.
- Pashler, H. E. (1998). The psychology of attention (Vol. 15). Cambridge, MA: MIT Press.
- Patrick, C. J. (1994). Emotion and psychopathy: Startling new insights. Psychophysiology, 31, 319–330.
- Patrick, C. J. (2007). Getting to the heart of psychopathy. In H. Hervé (Ed.), *The psychopath: Theory, research, and practice* (pp. 207–252). Mahwah, NJ: Erlbaum.
- Patrick, C. J., Bradley, M. M., & Lang, P. J. (1993). Emotion in the criminal psychopath: Startle reflex modulation. *Journal of Abnormal Psychology*, 102, 82–92.
- Patterson, C. M., Kosson, D. S., & Newman, J. P. (1987). Reaction to punishment, reflectivity, and passive avoidance learning in extraverts. *Journal of Personality and Social Psychology*, 52, 565–576.
- Patterson, C. M., & Newman, J. P. (1993). Reflectivity and learning from aversive events: Toward a psychological mechanism for the syndromes of disinhibition. *Psychological Review*, 100, 716–736.
- Posner, M. I. (Ed.). (2012). Cognitive neuroscience of attention. New York: Guilford Press.

- Raymond, J. E., Shapiro, K. L., & Arnell, K. M. (1992). Temporary suppression of visual processing in an RSVP task: An attentional blink? Journal of Experimental Psychology: Human Perception and Performance, 18, 849–860.
- Reidy, D. E., Zeichner, A., Hunnicutt-Ferguson, K., & Lilienfeld, S. O. (2008). Psychopathy traits and the processing of emotion words: Results of a lexical decision task. *Cognition and Emotion*, 22, 1174–1186.
- Sabri, M., Humphries, C., Verber, M., Mangalathu, J., Desai, A., Binder, J. R., et al. (2013). Perceptual demand modulates activation of human auditory cortex in response to task-irrelevant sounds. *Journal of Cognitive Neuroscience*, 25, 1553–1562.
- Sadeh, N., & Verona, E. (2012). Visual complexity attenuates emotional processing in psychopathy: Implications for fear-potentiated startle deficits. Cognitive, Affective, and Behavioral Neuroscience, 12, 346–360.
- Schneider, W., Dumais, S. T., & Shiffrin, R. M. (1982). Automatic/control processing and attention (No. HARL-ONR-8104). Urbana–Champaign: University of Illinois at Urbana–Champaign Human Attention Research Lab.
- Serences, J. T. (2011). Mechanisms of selective attention: Response enhancement, noise reduction, and efficient pooling of sensory responses. *Neuron*, 72, 685–687.
- Shapiro, D. (1965). Neurotic styles. New York: Basic Books.
- Shiffrin, R. M., & Schneider, W. (1977). Controlled and automatic human information processing: II. Perceptual learning, automatic attending and a general theory. *Psychological Review*, 84, 1–66.
- Siddle, D. A. T., & Spinks, J. A. (1992). Orienting, habituation, and the allocation of processing resources. In B. A. Campbell, H. Hayne, & R. Richardson (Eds.), Attention and information processing in infants and adults: Perspectives from human and animal research (pp. 227–262). Hillsdale, NJ: Erlbaum.
- Strauss, E. (1983). Perception of emotional words. Neuropsychologia, 21, 99–103.
- Tham, M. (2000). Overview of mechanistic modelling techniques. Unpublished manuscript, Department of Chemical and Process Engineering, Newcastle University. Retrieved from http://lorien.ncl.ac.uk/ming/ dynamics/modelling.pdf.
- Vitale, J. E., Brinkley, C. A., Hiatt, K. D., & Newman, J. P. (2007). Abnormal selective attention in psy-

chopathic female offenders. *Neuropsychology*, 21, 301–312.

- Vitale, J. E., Newman, J. P., Bates, J. E., Goodnight, J., Dodge, K. A., & Petit, G. S. (2005). Deficient behavioral inhibition and anomalous selective attention in a community sample of adolescents with psychopathic and low-anxiety traits. *Journal of Abnormal Child Psychology*, 33, 461–470.
- Wallace, J. F., Schmitt, W. A., Vitale, J. E., & Newman, J. P. (2000). Experimental investigations of information-processing deficiencies in psychopaths: Implications for diagnosis and treatment. In C. Gacono (Ed.), The clinical and forensic assessment of psychopathy: A practitioner's guide (pp. 87–109). Mahwah, NJ: Erlbaum.
- Wallace, J. F., Vitale, J. E., & Newman, J. P. (1999). Response modulation deficits: Implications for the diagnosis and treatment of psychopathy. *Journal of Cognitive Psychotherapy*, 13, 55–70.
- Weiskopf, D. A. (2011). Models and mechanisms in psychological explanation. Synthese, 183, 313–338.
- Wijers, A. A., Mulder, G., Okita, T., Mulder, L. J., & Scheffers, M. K. (1989). Attention to color: An analysis of selection, controlled search, and motor activation, using event-related potentials. *Psychophysiology*, 26, 89–109.
- Williamson, S., Harpur, T. J., & Hare, R. D. (1991). Abnormal processing of affective words by psychopaths. *Psychophysiology*, 28, 260–273.
- Wolf, R. C., Carpenter, R. W., Warren, C. M., Zeier, J. D., Baskin-Sommers, A. R., & Newman, J. P. (2012). Reduced susceptibility to the attentional blink in psychopathic offenders: Implications for the attention bottleneck hypothesis. *Neuropsychology*, 26, 102–109.
- Yang, Y., Raine, A., Joshi, A. A., Joshi, S., Chang, Y. T., Schug, R. A., et al. (2012). Frontal information flow and connectivity in psychopathy. *British Journal* of Psychiatry, 201, 408–409.
- Zeier, J. D., Maxwell, J. S., & Newman, J. P. (2009). Attention moderates the processing of inhibitory information in primary psychopathy. *Journal of Abnormal Psychology*, 118, 554–563.
- Zeier, J. D., & Newman, J. P. (2013). Feature-based attention and conflict monitoring in criminal offenders: Interactive relations of psychopathy with anxiety and externalizing. *Journal of Abnormal Psychology*, 122, 797–806.

# CHAPTER 5

# Temperament Risk Factors for Psychopathy

DON C. FOWLES

ervey Cleckley (1941/1976) proposed that an underlying deficit contributes significantly to the etiology of psychopathy. David Lykken famously hypothesized temperamental poor anxiety conditioning (1957) or low fear (1995) as the origin of this deficit (see also Fowles & Dindo, 2006). The construct of psychopathy intersects with a broad group of conditions: externalizing disorders, encompassing conduct problems, aggression, alcohol and other substance abuse, and impulsivity. The associated diagnoses in the latest, fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association [APA], 2013) Section II diagnoses are antisocial personality disorder (ASPD), conduct disorder (CD), oppositional defiant disorder (ODD), alcohol use/substance use disorders, and attention-deficit/hyperactivity disorder (ADHD). This chapter examines the current theory and research on temperament dimensions that contribute to the etiology of psychopathy. After considering preliminary issues, it reviews empirical findings on psychopathy in adults and older adolescents, then examines research on childhood disorders that is relevant to the developmental psychopathology of psychopathy.

Among the preliminary issues are dimensions of temperament inferred from work on self-report personality traits and biobehavioral systems. The former include neuroticism, extraversion, agreeableness-antagonism, and conscientiousness. The latter include the three traditional reward-approach, fear, and behavioral inhibition systems, as well as the more recent executive control system. Research on psychopathy in adults has strongly documented two somewhat independent dimensions that, to a significant extent, reflect different temperament risk factors. A temperament of low fear and anxiety contributes to the first dimension, whereas disinhibition due to deficient executive control combined with high negative emotionality-tendencies indicative of general proneness to externalizing problems-appears to contribute to the second dimension. Research on psychopathy in younger samples has shown that diagnoses of ADHD comorbid with CD define a group at high risk for later psychopathy. Characteristics of poor executive control and neuroticism associated with this diagnostic configuration likely represent childhood precursors to the second psychopathy dimension. Characteristics of fearlessness and callousness-unemotionality evident in a smaller subset of children with ADHD-CD are probable antecedents to the first psychopathy dimension. These temperament risk factors interact with parenting and other socioenvironmental influences to produce varied adult phenotypes, only some of which meet criteria for psychopathy. The phenotype of *meanness*, recently proposed as a third dimension of psychopathy, similarly evolves when an unfortunate combination of temperament, parenting, and other socioenvironmental variables produce an especially negative environmental trajectory.

# **Preliminary Considerations**

#### The Complexity of Models of Etiology

#### Genetic and Environmental Contributions

Although the twin studies reviewed below show large additive genetic effects for aggressive externalizing conditions and psychopathy more specifically, the "additive genetic" variance contains an unknown amount of gene × environment ( $G \times E$ ) interaction (Nigg, 2012; Purcell & Sham, 2002). The importance of the environment also is underscored by the concepts of gene expression and epigenetics (e.g., Allis, Jenuwein, & Reinberg, 2007; Carey, 2012; Francis, 2011; Rutter, 2006). Thus, there is every reason to assume that temperament reflects both genetic and environmental contributions.

# Multimethod Effects

From the standpoint of Campbell and Fiske's (1959) multitrait-multimethod conception, lower correlations are expected between measures of the same construct (e.g., fear) from different assessment domains (see also Patrick, Durbin, & Moser, 2012). This point applies especially to attempts to relate physiological indices to self-report or clinical rating indices. In addition to different methods, such correlations are attenuated by two additional factors. First, the self-report/ratings dimension contains variance irrelevant to the physiological construct. Second, the physiological index usually consists of a single measure, rather like a singleitem questionnaire whose reliability is less than optimal, limiting its potential correlation with other measures. In view of these limitations, the replicability of the findings in the review below are especially impressive.

#### Developmental Psychopathology Models

Developmental psychopathology research has shown that there are multiple contributors to outcomes (both adaptive and maladaptive), for which relative contributions are likely to vary across individuals, with myriad ontogenic paths leading to any given phenotypic outcome (Cicchetti, 2013; see also Beauchaine & McNulty, 2013). The fundamentally important principles of equifinality and multifinality (e.g., Cicchetti, 2013; Frick & Viding, 2009) stipulate, respectively, that (1) a diversity of complex pathways may lead to the same outcome, and (2) any original starting point is likely to result in diverse outcomes. As applied to psychopathy, these principles mean that specific psychopathic features can result from different etiological processes and pathways, and causal processes or risk factors will show only a probabilistic relationship with the development of psychopathy—due to interplay with other variables.

#### Dimensions of Temperament

#### Dimensions Based on Self-Report Inventories

Factor analyses of temperament measures in the domain of self-report have yielded from two ("Big Two") to five major factors ("Big Five" or FFM, for five-factor model). On the basis of a meta-analysis of published studies and a parallel analysis based on their own data, Markon, Krueger, and Watson (2005) concluded that temperament measures can be subsumed in a hierarchical model, with the Big Two at the top, descending from there through levels of Big Three, Big Four, and Big Five.

Two-factor solutions produce dimensions alternatively labeled (1) Neuroticism, Negative Emotionality (NEM) or Negative Affect (NA), and (2) Extraversion or Positive Emotionality (PEM). With three factors, Neuroticism/NEM/NA splits into NA and disinhibition dimensions, whereas PEM remains about the same. These three factors correspond to the three factors of Tellegen's (1982) Multidimensional Personality Questionnaire (MPQ): Negative Emotionality (Neuroticism), Positive Emotionality (Extraversion), and Constraint (Reversed Disinhibition). In the developmental literature, the antecedent to Constraint is Rothbart's effortful control construct (Krueger, Markon, Patrick, Benning, & Kramer, 2007, p. 645; Nigg, 2006a, 2006b, p. 144, Table 6.1; Rothbart & Ahadi, 1994). At the four-factor level, NEM and PEM remain more or less the same but Disinhibition splits into "Disagreeable Disinhibition" and "Unconscientious Disinhibition." At the five-factor level, NEM and the two forms of Disinhibition remain the same but PEM splits into Extraversion/PEM and Openness (to experience). The factors at this level correspond roughly to the broad dimensions of the well-known FFM, as represented, for example, in the NEO Personality Inventory-Revised (NEO-PI-R; Costa & McCrae, 1992): Neuroticism, Extraversion, Conscientiousness (vs. Undirectedness), Agreeableness (vs. Antagonism), and Openness. However, Openness as indexed by the NEO-PI-R includes some specific content that is not well represented by the higherlevel factors delineated by Markon and colleagues (2005), and that does not appear temperament-oriented-thus playing a limited role in the literature of primary interest here. Consequently, this review centers on the Big Three and Big Four models (Big 5 with Openness deleted), the difference being that MPQ Constraint in the Big Three splits into NEO-PI-R Agreeableness (vs. Antagonism) and Conscientiousness in the Big Four.

In addition to a strong association with Disinhibition, Antagonism encompasses some secondary aspects of NEM-in particular, hostility, mistrust, aggressiveness, callousness, and manipulativeness. As a function of this, there is a clear affective/motivational aspect to Antagonism, as indicated by items such as aggression and rejection of others. In addition, Antagonism includes disagreeable attitudes and behaviors that presumably reflect environmental influences. To anticipate the discussion below, many of the behaviors associated with Antagonism involve conflict between impulses to seek rewards or reactively aggress on the one hand, and a desire to avoid negative consequences for behavior that violates social norms on the other. Thus, on average, Antagonism involves Disinhibition in a context of motivated behavior and high NEM, although it includes some low-fear-based antisocial behavior as well. As reviewed below, this combination of Disinhibition and NEM is relevant to one path to psychopathy.

In contrast to Antagonism, Conscientiousness in Markon and colleagues' (2005) analysis relates to aspects of inhibitory control that do not involve strong emotional/motivational components (e.g., achievement, persistence, competence, order, dutifulness, discipline, deliberateness). Again, to anticipate the discussion below, this dimension appears to reflect executive control in domains other than control of motivated/emotional behavior (i.e., nonaffective executive control).

DeYoung, Quilty, and Peterson (2007) decomposed the Big Five factors (indexed via the NEO-PI-R) into two subfactors each. Of special interest for the review that follows, Neuroticism split into (1) the externalizing features of stability (reversed), angry hostility, and impulsiveness (collectively labeled Volatility), implying problems of disinhibition and outwardly expressed NA (the component represented in Antagonism) versus (2) the internalizing problems of anxiety, depression, self-consciousness, and feeling threatened (collectively labeled Withdrawal). This major subdivision within NEM appears to reflect whether the NA is disinhibited or controlled (David Watson, personal communication, September 10, 2014), and it is Volatility in particular that is associated with Antagonism. The distinction between the two dimensions also may reflect variations in the nature of anger (e.g., Spielberger's [1996; Spielberger, Jacobs, Russell, & Crane, 1983] distinction between "anger in" and "anger out").

In addition, DeYoung and colleagues (2007) found that Agreeableness split into compassionate emotional affiliation (labeled Compassion) versus cooperation, compliance, and straightforwardness (collectively labeled Politeness). Of relevance to this review, the affiliation component of Agreeableness is relevant to the callous interpersonal (meanness) aspects of psychopathy.

#### Anxiety and Fear

As noted, NEM is the dimension of temperament with clearest relevance to anxiety and/or fear. However, an extensive review by Sylvers, Lilienfeld, and LaPrairie (2011) found that the distinction between self-reported trait fear and trait anxiety is not a simple one. Conceptualizations of trait fear and trait anxiety vary across authors, as do assumptions about their relationship, with many authors conceptualizing these constructs as largely or entirely interchangeable and aptly measured using correlated trait scales. Nevertheless, Sylvers and colleagues concluded that there are distinct differences: trait fear emphasizes "freezing and avoidance behaviors aimed at an array of specific threats" (p. 134). In contrast, trait anxiety involves "sustained hypervigilance" and a prolonged "aversive emotional state that occurs while an organism approaches an ambiguous and uncertain threat" (p. 133, emphasis added). Thus, trait fear involves avoidance behavior to an imminent threat, whereas trait anxiety is associated with risky approach behavior in contexts involving potential threat a conceptualization identical to Gray's (e.g., 1982, 1987) neurobehavioral conception of fear versus anxiety (see below). Differentiating between fear and anxiety may be more difficult with self-report assessments than it is in other domains, such as behavioral observations or measures of the brain's reactivity.

Paralleling the distinction made by Sylvers and colleagues (2011) and Gray (e.g., 1982, 1987), a factor analysis of psychiatric diagnoses in a large sample of noninstitutionalized U.S. civilians by Krueger (1999) revealed a broad internalizing disorders factor that subdivided into correlated lower-order factors of anxious-misery and fear. Similarly, Krueger and Markon's (2006) meta-analysis of comorbidity findings revealed an internalizing disorders factor that bifurcated into highly correlated (r = .73) distress and fear subfactors. Thus, anxiety and fear can be separated, but they are closely correlated in many contexts. Indeed, it is reasonable to presume that these states are functionally connected. Activation of the behavioral inhibition system (BIS; e.g., Gray, 1982, 1987; see below) produces heightened perceptions of fear, and variations in fear system reactivity will affect when the BIS is activated (Corr & McNaughton, 2015). Clinical theories are consistent with this mutual influence: In Barlow's (1988) theory of panic disorder, for example, the anxiety system is apprehensive about future panic attacks (i.e., the panic attacks activate anxiety); reciprocally, a high level of anxiety may serve as a "platform" for panic attacks (p. 155).

#### **Biobehavioral Dimensions**

Gray's familiar work (e.g., 1978, 1979, 1982, 1987; Gray & McNaughton, 2000; see also Fowles, 1980, 2006) provided a framework for understanding processes relevant to temperament in terms of three basic brain motivational systems. The first is a reward-seeking system that activates behavior in response to conditioned stimuli for rewards or relieving nonpunishment, termed the "behavioral approach system" by Gray (1978, 1979) and the "behavioral activation system" by Fowles (1980), abbreviated in each case as the BAS. Depue (Depue & Collins, 1999; Depue & Iacono, 1989; Depue & Lenzenweger, 2001) described a similar behavioral facilitation system (BFS). Both Gray and Depue identified the BAS/BFS as involving the mesolimbic dopamine (DA) system that ascends from the A10 nucleus in the ventral tegmental area to the nucleus accumbens and the ventral striatum. This system is central to substance addiction (e.g., Leshner, 1997; Robinson & Berridge, 2003; Wise & Bozarth, 1987). Thus, the BAS/BFS is well supported as a neurobiological affective-motivational system, and it has generally been seen as relevant to Extraversion (e.g., Depue & Collins, 1999; Depue & Lenzenweger, 2001; Rothbart, Ahadi, Hershey, & Fisher, 2001). I refer to this as the *reward-approach system* throughout this chapter.

Gray's second system, the BIS, inhibits or regulates approach (or active avoidance) behavior that might lead to aversive outcomes (e.g., punishment or frustrative nonreward) in response to cues for novelty and conditioned stimuli for punishment or frustrative nonreward. When it detects goal conflict, the BIS redirects attention and activates information-gathering behavior (e.g., exploratory, risk assessment) to resolve the approach–avoidance conflict. When the threat is great enough, "otherwise prepotent behavior will be inhibited and behavior leading to the avoidance of negative outcomes will be favoured" (Gray & McNaughton, 2000, p. 233); that is, more adaptive behavior will be implemented.

Anxiolytic drugs impair functioning of the BIS; that is, they reduce the ability to inhibit dominant/prepotent but incorrect responses (Gray, 1977; Gray & McNaughton, 2000, Chapters 1 and 4). Although Gray viewed the BIS as an anxiety system, the core feature of the BIS is inhibition of behavior when appropriate (Gray & McNaughton, 2000, p. 234), not the production of an introspective state that we label "anxiety." In Gray and Mc-Naughton's view, the BIS is activated only when danger stimuli "must be approached" (p. 84, original emphasis) and only when input is such as to produce "a genuine conflict between incompatible goals" (p. 86, emphasis added). In contrast, a mirror drawing task produces motor conflict but does not involve motivational conflict (pp. 24, 32, 241).

In a highly restrictive usage, Gray and McNaughton (2000) stated that only BIS activation constitutes "anxiety" in their theory. Concepts of neuroticism or trait anxiousness represent "susceptibility to anxiety-related disorders" (p. 341), related to overall defense system responsiveness and "general sensitivity to threat" (p. 338). Whereas only a subset of threat-related stimuli (i.e., conflict-producing stimuli) increases anxiety as they defined it (i.e., as BIS activation), core affective processes not involving motivational conflictsuch as a perceived sense of uncontrollability (a key vulnerability to anxiety disorders; Barlow, 2000, 2002), classical aversive fear conditioning, and panic-affect susceptibility to anxiety disorders. Thus, while individual differences in BIS reactivity contribute to trait anxiety, other factors also are important (Fowles, 2006).

Gray (1977) identified the septo-hippocampal system (SHS) of the brain as the core neurobio-

logical substrate of the BIS. Subsquently, Gray and McNaughton (2000, pp. 110, 281) characterized the SHS as the core computational structure of the BIS, suggesting that it effects aversive arousal by sending input to the amygdala (a structure crucial for fear) while also having more general alerting and action-priming functions (see also Fowles, 2006). As defensive distance decreases (i.e., the threat draws nearer), the SHS increases arousal by activating the amygdala, producing an increase in arousal and autonomic changes similar to the activation of the fight-flight system. At the same time, the SHS inhibits the behavioral expression of the fight-flight response (Gray & McNaughton, 2000, p. 110). Should the need arise, termination of BIS inhibition provides a mechanism for instigating immediate fight-flight behavior. Additionally, Gray and McNaughton (see Figure 11.1, p. 276) posit that defensive distance is greatest when the SHS receives input regarding distal threat stimuli from the prefrontal cortex.

Consistent with this emphasis on cognitive aspects of the BIS, Gray and McNaughton (2000, pp. 34-35, 289-290, 293) proposed that the wellestablished excessive cognitive/attentional focus on potential threats in generalized anxiety disorder (GAD) can be understood as the manifestation of excessive activity in the SHS. Additionally, highlevel cognitive mechanisms, especially in humans, are critical to the evaluation of cues as indicative of potential negative affective events and thus to activation of the BIS (Gray & McNaughton, 2000, pp. 71, 276, 291). Corr and McNaughton (2015) fully incorporate prefrontal components as part of the BIS, noting that until now the prefrontal components have been poorly specified. They also emphasize that the BIS is not unitary, and that dysfunction of the prefrontal components can be independent of the subcortical components. From this perspective, the BIS monitors the environment for potential adverse outcomes of behavior (goal conflict with respect to approach behavior), involves considerable cognitive processing and redirection of attention to gather information to resolve the conflict (including evaluative input from higher cognitive functions in humans) and, when needed, substitutes a more adaptive behavior.

Gray's third system was the fight–flight–fear system, which will be called the "fear system" here. This system responds to a variety of fear stimuli, both innate and conditioned, by moving away (withdrawing) from the threat. Thus, defensive direction fundamentally distinguishes between the BIS (passive readiness) and the fear (active escape) system. As is very well known, the central nucleus of the amygdala is a core part of the brain's fear reactivity system (e.g., Davis, Walker, Miles, & Grillon, 2009).

#### **Executive Functions and Executive Control**

#### Executive versus Motivational/ Affective Control

A vast literature employs the term "executive function" (EF) and related constructs (e.g., executive control, cognitive control, self-regulation) to refer to a phylogenetically advanced, complex regulatory system that regulates both behavior and emotions. I use EFs to refer to the complex multiple functions included in this concept, and "executive control" to refer to these functions as a system. Especially in the literature on ADHD, EFs are contrasted with a phylogenetically older motivational system: This older system is viewed as relatively automatic and with a motivational/ affective component, whereas the executive control system is intentional and effortful. Two wellknown portrayals of this distinction are cited in the developmental psychopathology literature and serve to illustrate its features. Kahneman (2011) employs a two-systems model. System 1 is fast and automatic, with minimal effort and without a sense of voluntary control, whereas System 2 involves effortful mental activities "associated with the subjective experience of agency, choice, and concentration" (p. 21). System 1 runs automatically as the default system. System 2 is kicked into action when System 1 runs into difficulty and/or when a detected event violates System 1's model of the world (note the similarity to the BIS). System 2 also operates continuously to monitor one's own behavior (e.g., suppressing anger in favor of politeness, or maintaining alertness when driving at night).

Mischel's (e.g., Mischel & Ayduk, 2004, 2010; see also Metcalfe & Mischel, 1999) contrast between hot and cool systems proposes a similar distinction—of special interest here because of the focus on controlling emotional/motivated behavior. The hot system relates to quick emotional responding, involving "rapid fight or flight reactions, as well as necessary appetitive approach responses" or "appetitive and defensive motivational systems" (cf. Gray's fear system and BAS), with the amygdala considered by some to be central to hot processing (Mischel & Ayduk, 2010, pp. 85–86, 93). The cool or "effortful control" (or "self-regulatory," or "willpower") system involves higher-level cognitive processing, elaborately interconnected knowledge, and language, and is slow and contemplative. It is associated with hippocampal and frontal lobe processing. Cognitive rumination is the hallmark. The delay of gratification paradigm (one cookie/ marshmallow now vs. two later), with its phenomenon of temporal discounting, is the prototype task. However, Mischel and Ayduk contend that both hot and cool systems and their interactions are essential to effective delay of gratification. Processes associated with the cool system apply to emotional self-regulation-both the externalizing emotions of anger, hostility, and jealousy, and the internalizing emotion of anxiety. Conditions of low to moderate stress enhance the cool system's efficacy, whereas high stress (as determined jointly by traits and situational factors) activates the hot system and attenuates or even shuts down the cool system. Close connections between the hot and cool systems facilitate continuous interplay between the two, codetermining phenomenological experiences and behavioral responses. From this standpoint, effortful control is possible to the extent that the cool system input is able to activate (i.e., cool) corresponding hot system representations. Thus, for the control of affective/motivationally based experience and behavior, the hot and cool systems are closely related rather than being largely independent systems. On this point, Damasio's (1994, pp. 173–183) somatic marker hypothesis similarly emphasizes the importance of hot or emotional responses and the integration of cognitive and emotional or cortical and limbic systems in the regulation of behavior.

#### Constraint/Effortful Control and the BIS

MPQ Constraint reflects "the tendency to behave in an undercontrolled versus overcontrolled manner. . . . [C]onstrained individuals plan carefully, avoid risk or danger, and are controlled more strongly by the longer-term implications of their behavior" (Clark & Watson, 1999, p. 403). Rothbart and Ahadi (1994, p. 57) describe the parallel childhood dimension of effortful control as allowing "modulation of approach and expressiveness according to situational demands or explicit instructions from adults" (p. 57) and as enabling the child "to effortfully or willfully inhibit a forbidden impulse, refrain from wrongdoing, and to respond instead in an acceptable or desired manner" (p. 60). Eisenberg and colleagues (2003, p. 876, quoting Rothbart & Bates, 1998, p. 137) describe it more simply as "the ability to inhibit a dominant response to perform a subdominant response."

The functions of the BIS overlap with important core functions of effortful control. The fundamental difference between the conceptualizations of the two is that effortful control explicitly includes the cool system EF contributions of executive control. Given that both systems are seen as inhibiting prepotent responses when they are maladaptive, redirecting attention to take in new information, and substituting a more adaptive response, and given that the BIS receives input from higher cortical centers, it is reasonable to hypothesize that evolutionarily new cool system cognitive capacity would work in synergy with older systems to regulate motivated behavior-as proposed by Mischel and Ayduk (2004) and by Corr and McNaughton (2015) specifically for the BIS. In a similar vein, Gross and Thompson (2007, p. 8) concluded that automatic, unconscious processes are strongly involved in emotion regulation, and viewed emotion regulation as a "continuum from conscious, effortful and controlled regulation to unconscious, effortless, and automatic regulation."

If this perspective is correct, it is likely to be difficult in goal conflict situations to assess contributions of the BIS in complete isolation from those of executive control. In contrast, many EF tasks may not involve obvious goal conflict and might therefore reflect EF capacities without BIS contributions. As we see below, tasks that may not involve the BIS have been employed to assess EFs in research on ADHD and have yielded clear results. The greater difficulty is in distinguishing between effortful control and the BIS in regulating motivated behavior.

There are important differences between the BIS and effortful control as related to emotion regulation. Effortful control operates to regulate both internalized and externalized expressions of emotion—with respect to both the phenomenological intensity of the emotion and the maladaptive expression of the emotion (e.g., Eisenberg, Spinrad, & Eggum, 2010). The BIS, in contrast, is less likely to directly regulate or reduce the intensity of *expe*rienced emotion, but does regulate the maladaptive behavioral expression of the emotion (e.g., inhibition of fear-anger-frustration-elicited aggression or inappropriate escape). As I mentioned earlier, during approach, the BIS directly inhibits the expression of fear-based arousal unless circumstances demand fight or flight. Thus, a weak BIS will be associated with disinhibited fear-anger-frustration responses. Finally, to the extent that behavioral expression of emotions affects their experienced intensity, the BIS can have an indirect effect on experienced emotional intensity.

To some extent, there can be an inverse relationship between the strength of the BIS and anxious arousal (Fowles, 1987). A strong BIS may produce predominant passive avoidance that maximizes defensive distance from threats, whereas a weak BIS may result in approach toward punishment, with heightened anxiety and fear due to imminent threats (see also Corr & McNaughton, 2015). In approach-avoidance terms, a weak BIS would produce a steeper avoidance gradient, which would reduce inhibition and anxiety until punishment becomes highly salient (i.e., physically or temporally close), strongly activating the fear system. An example of increased fear and anxiety due to a failure of regulation is seen in antisocial children and adolescents, in whom degree of experienced distress is associated with the severity of observed conduct problems and, presumably, the stresses encountered as a result of such problems (e.g., Frick & White, 2008; see below).

#### Summary

For temperament as assessed by self-report measures, Big Three and Big Four models stand out. Both include some version of Neuroticism/NEM/ NA and Extraversion/PEM dimensions, but they differ in that the Big Three includes a single dimension of disinhibition (Constraint), whereas this dimension splits into antagonism–agreeableness (disagreeable disinhibition) and unconscientious disinhibition factors in the Big Four—an important difference being that disagreeable disinhibition is strongly associated with emotional/motivated behavior (especially high NEM), whereas unconscientious disinhibition appears to refer to failures in control of less emotional behavior.

Although trait fear and trait anxiety are often confused, at a conceptual level the former involves avoidance behavior or withdrawal from an imminent threat, whereas the latter (presumed to be associated with the BIS) may be associated with risky approach behavior. At the level of biobehavioral systems relevant to temperament, Gray's BAS, BIS, and fear systems often are cited. More recently, an executive control system associated with the greatly expanded prefrontal cortex in humans is widely proposed. The BIS has to do with behavioral inhibition in the context of goal conflict more than with the broad construct of Neuroticism, which includes many sources of negative affect in addition to the distinctive anxious/ inhibitory arousal seen to be associated with BIS activation.

# **Psychopathy in Adults**

# The Two Psychopathy Factors

As discussed in other chapters of this volume, the 20-item Psychopathy Checklist—Revised (PCL-R; Hare, 1991, 2003) is widely used for psychopathy diagnoses in research with prison populations. Factor analyses of this scale have produced two-, three-, and four-factor solutions (see Hare, Neumann, & Mokros, Chapter 3, this volume). Most research has focused on the two-factor solution (Patrick & Bernat, 2009), in which factors are correlated at about .5, and these are the focus of this review. The two PCL-R factors are characterized as affective-interpersonal or "core features" of psychopathy (Factor 1), and impulsive-antisocial tendencies (Factor 2) (Benning, Patrick, Hicks, Blonigen, & Krueger, 2003; Hare, 1991, 2003; Harpur, Hare, & Hakstian, 1989). In personality terms, the correlation between the two factors is largely attributable to variance associated with Big Four or Big Five Antagonism (Lynam, Miller, & Derefinko, Chapter 11, this volume).

The self-report-based Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996; Lilienfeld & Fowler, 2006) was designed to assess psychopathy in noncriminal populations. Factor analyses of the PPI's eight subscales (e.g., Benning et al., 2003; Benning, Patrick, Salekin, & Leistico, 2005) have revealed two higher-order factors, alternatively labeled PPI-I or Fearless Dominance, and PPI-II or Impulsive Antisociality. Notably, in contrast with the correlated factors of the PCL-R, the two factors of the PPI are orthogonal. The fact that the PCL-R factors are correlated likely has less to do with core temperament-based aspects of antagonism, and more to do with disagreeable attitudes and behaviors that are likely to occur at high rates in incarcerated samples. Validity studies indicate considerable parallelism between PPI Factors I and II and PCL-R Factors 1 and 2, despite their differing assessment formats (e.g., Poythress et al., 2010). However, the two psychopathy factors are more clearly differentiated in the PPI, with the PPI's Fearless Dominance factor in particular reflecting more of the positive psychological adjustment (i.e., "boldness") aspects of psychopathy seen in Cleckley's (1941/1976) concept of psychopathy, and less of the callous-unemotional or meanness component (see Patrick, Fowles, & Krueger, 2009, as discussed below).

The terms "psychopathy Factor 1" and "psychopathy Factor 2," or, more briefly, F1 and F2, are used in this review to designate the two broad factors of the PCL-R/PPI, or counterpart factors from other psychopathy inventories.

#### Factor 1 and the Low-Fear Hypothesis

Early findings of diverging relations for the two correlated PCL-R factors with many different criterion measures (cf. Hare, 1991) raised the possibility that psychopathy is not a unitary construct. A key development was Patrick's application of the fear- or aversive-potentiated startle paradigm (e.g., Bradley, Cuthbert, & Lang, 1999; Lang, Bradley, & Cuthbert, 1990), a biologically based index of fear, to psychopathy. Patrick, Bradley, and Lang (1993) reported that psychopathic offenders, as defined by the PCL-R, failed to show normal augmentation (potentiation) of the noise-elicited blink reflex during viewing of aversive pictures, but they did show normal attenuation of startle during viewing of pleasant pictures-a strong affirmation of Lykken's low-fear hypothesis of psychopathy. Importantly, the deficit in startle potentiation was specific to F1 of the PCL-R (Patrick et al., 1993), consistent with the idea that these core features of psychopathy reflect low fear (Lykken, 1995). In contrast, aversive startle potentiation was unrelated to F2.

This finding of a deficit in aversive startle potentiation in high-psychopathic individuals, related specifically to scores on F1, has been widely replicated in male prisoners (see Patrick & Bernat, 2009) and demonstrated also in low anxious/ high-PCL-R female prisoners (Verona, Bresin, & Patrick, 2013; see also Sutton, Vitale, & Newman, 2002). The deficit has also been found for young males from the community scoring very high on F1 (Benning, Patrick, Blonigen, Hicks, & Iacono, 2005), and for college participants scoring low on a measure of trait fear (Vaidyanathan, Patrick, & Bernat, 2009), reflecting the dimension in common among multiple self-report measures of fearful versus fearless tendencies (cf. Kramer, Patrick, Krueger, & Gasperi, 2012). Given these direct and constructive replications, the lack of aversive startle potentiation in high F1 individuals stands as one of the most robust and theoretically coherent findings in the psychopathology literature. The robustness is even more impressive considering the cross-domain nature of the association (i.e., physiological vs. self-report), as noted earlier.

The theoretical importance of this finding warrants particular mention. The affective–interpersonal or "core features" of psychopathy F1 are reliably related to a major psychophysiological index of low fear—strongly supporting Lykken's theory. Trait fear, a normative dispositional dimension that overlaps with PPI Factor I and the interpersonal features of PCL-R F1, likewise predicts aversive startle potentiation (see Patrick & Bernat, 2009, for more extensive information on trait fear and its representation in PPI-I). This contribution of fearless temperament is consistent with Rutter's (2006, p. 80) conclusion that genetic influences on psycholopathology act indirectly through effects on variations in temperament and personality.

#### Distinct Correlates of the Two Psychopathy Factors

The finding of deficient startle potentiation specifically in relation to F1 raised the question of whether F2 might relate to a different deficit—and whether psychopathy might best be conceptualized in terms of a "dual-deficit" or "two-process" model. Along this line, Patrick and Lang (1999; see also Patrick, Cuthbert, & Lang, 1994) postulated that F2 might relate to a dysfunction of higher brain systems necessary for processing of abstract or symbolic affective stimuli, reflecting a higherorder information-processing deficit—a suggestion consistent with an executive control deficit.

This hypothesis led Patrick and his colleagues to explore systematically the correlates of the two psychopathy factors, and to find them to be quite distinct. For the two PCL-R factors, diverging relations with criterion measures of various types were particularly evident when controlling for their covariance. PCL-R F1 scores correlate positively with social dominance, achievement, and trait positive affect and negatively with empathy. PCL-R F2 scores correlate positively with aggression, impulsivity, and sensation seeking; symptoms of ASPD; and alcohol and drug dependence. The fear, anxiety, and depression components of NEM correlate negatively with F1, wheras F2 correlates positively with all components of negative affect: anger, aggression, and alienation, as well as distress, fear, and stress reaction (Fowles & Dindo, 2006). PPI Fearless Dominance (PPI-I) is positively associated with well-being, interpersonal assertiveness, narcissism, and thrill-seeking behavior and negatively associated with anxiousness, depression, and empathy (Skeem, Polaschek, Patrick, & Lilienfeld, 2011). PPI Impulsive Antisociality (PPI-II) is associated with "maladaptive dispositional and behavioral tendencies" such as impulsivity, aggressiveness, antisocial behavior (both child and adult), substance use problems, dysphoria and distress, and suicidal ideation (Skeem et al., 2011, p. 103). Thus, these correlates parallel and affirm those of the PCL-R factors.

To address the question of what PCL-R psychopathy as a whole reflects in light of contrasting correlates for the two factors, Hicks, Markon, Patrick, Krueger, and Newman (2004) undertook a cluster analysis of MPQ personality profiles for incarcerated offenders attaining high overall scores on the PCL-R. They found two subgroups, labeled "emotionally stable" and "aggressive" subtypes, with strongly contrasting personality profiles that paralleled the trait correlates of PCL-R F1 and F2, respectively (for details, see Hicks & Drislane, Chapter 13, this volume). In another cluster-analytic study of high PCL-R scoring offenders, Skeem, Johansson, Andershed, Kerr, and Louden (2007) reported highly similar results.

#### General Externalizing Proneness and Psychopathy Factor 2

Applying confirmatory factor analysis to a large national sample of adult psychiatric disorders, Krueger (1999) found broad internalizing and externalizing factors (with correlated anxious-misery and fear subfactors for the internalizing factor) that were positively correlated with each other (r = .51). The latent externalizing factor, encompassing antisocial personality and substance-related conditions, is ostensibly relevant to psychopathy Factor 2.

In subsequent work using data from 17-year-old twins, Krueger and colleagues (2002) presented a model of the externalizing spectrum in which a broad, highly heritable (81%) externalizing (disinhibitory) latent trait was common to, and accounted for the covariance among, five variables consisting of child and adolescent antisocial behavior, alcohol and drug dependence, and a measure of unrestrained-impulsive personality (MPQ Constraint scores, reversed). Each variable also showed a significant nonshared environmental contribution, interpreted as accounting for the expression of the latent trait in that specific manifest (phenotypic) form, with the child antisocial behavior variable also showing a contribution of shared environment. Extending this work, Krueger and colleagues (2007) developed the selfreport Externalizing Spectrum Inventory (ESI) to operationalize a more comprehensive model of this problem domain. Structural analyses of the ESI's 23 facet scales (covering content related to impulsive/sensation-seeking, lack of responsibility, dishonesty, aggression in differing forms, and alcohol/drug use and problems) revealed a general externalizing factor on which all scales loaded, and two subfactors separable from the general factor—labeled "callous aggression" and "substance abuse" by Patrick, Kramer, Krueger, and Markon (2013). The emergence of these subfactors suggests that coherent processes separate from the general externalizing liability contribute to phenotypic expressions entailing predatory–aggressive behavior and substance-related addictions.

Work by Patrick, Hicks, Krueger, and Lang (2005) demonstrated a very strong relationship for this broad externalizing factor with PCL-R F2, each modeled as latent variables. They found essentially complete overlap between the two (r = .94), whereas variance specific to F1 showed a nonsignificant negative correlation (r = -.16) with general externalizing proneness. Blonigen and colleagues (2005) reported similar results for the two factors of the PPI (i.e., scores on the general externalizing factor were associated strongly and selectively with PPI-II). Like the association between F1 and low fear, this association between F2 and the externalizing factor, shown to reflect a highly heritable disinhibitory liability (Krueger et al., 2002), is of fundamental theoretical importance. This disinhibitory factor has a clear counterpart in models of temperament (e.g., MPQ Constraint; Rothbart's effortful control).

#### The Nature of Externalizing Disinhibition

The externalizing spectrum model views disinhibition (rather than strong reward-approach motivation) as the core liability (e.g., Krueger et al., 2002, 2007; Krueger & Markon, 2006). Although weak inhibitory control is central to this formulation, the deficit is viewed more broadly as one of executive control processes, including poor emotion regulation. For example, disinhibition involves "a lack of planfulness and foresight, impaired regulation of affect and urges, insistence on immediate gratification, and deficient behavioral restraint" (Patrick, 2010, p. 31), presumably related to "frontal-brain based differences in the capacity to restrain behavior and regulate affect in the service of non-immediate goals" (Patrick & Drislane, 2015, p. 629). As we see below, a similar construct appears to be important for ADHD.

Another literature relevant to disinhibition is reduced amplitude of the P300 (or P3) response, a brain event-related potential (ERP) that occurs in relation to infrequent but significant stimuli, at maximal levels over parietal scalp regions. Reduced P3 amplitude has been found for externalizing disorders of various types (Iacono, Carlson, Malone, & McGue, 2002), and the association between P3 amplitude and individual externalizing disorders is attributable to the general disinhibitory factor they have in common (Patrick et al., 2006). Moreover, the relationship between reduced P3 amplitude and general disinhibitory tendencies is largely attributable to shared genetic influences (Hicks et al., 2007; Yancey, Venables, Hicks, & Patrick, 2013), confirming that this brain response deficit reflects some process that conveys a risk for externalizing disorders. However, the functional significance of the P3 as related to disinhibitory liability remains unclear at this time (Patrick, Durbin, & Moser, 2012).

Reduced amplitude of another well-known brain ERP variable, the error-related negativity (ERN) response—a negative ERP deflection that peaks within about 100 milliseconds following commission of errors in a laboratory task-has been linked to general externalizing proneness in college participants (Hall, Bernat, & Patrick, 2007). The ERN is believed to reflect online selfmonitoring for erroneous behavioral responses in task performance contexts. The anterior cingulate cortex (ACC), thought to be important for selfmonitoring and behavioral regulation, appears to be the primary neural generator of the ERN. Thus, impairment in this measure of brain response appears highly relevant to the disinhibitory deficit hypothesis.

#### *Comparison of Factor 1 and Factor 2 Pathways*

The foregoing summary points to low fear/anxiety with elevated reward-approach (agentic positive emotionality) as the dispositional essence of F1 tendencies, and an executive control/disinhibitory deficit in conjunction with high Neuroticism/ NEM as the dispositional style associated with F2 tendencies. In turn, this picture suggests a conceptual distinction between the types of impulsivity associated with fearlessness versus disinhibition. In cases in which F1 is undergirded by fearlessness per se, affiliated impulsive tendencies would reflect a willingness to take risks due to an absence of normal fear-based restraint, and the behavior might well be highly efficacious and adaptive. In other cases involving dispositional fearlessness accompanied by a weak BIS (as conceptualized by Lykken [1995]), impulsive tendencies would reflect a weakened ability to inhibit responses resulting in punishment or nonreward (i.e., a dominant orientation toward approach in passive avoidance contexts that often results in adverse outcomes). In contrast, the impulsivity associated with F2 is theorized to entail a broader, more severe lack of inhibitory control based in EF dysfunction. Along with a failure to inhibit behaviors leading to punishment and frustration, this deficit involves salient weakness in the capacity to regulate emotion and to pursue adaptive courses of behavior, abilities that tend to be associated with normal conscientiousness. Additionally, F2 is associated with elevated NEM, expressed as angry and aggressive behavior under conditions of threat, provocation, or frustration.

#### **Callous-Unemotionality or Meanness**

Historically, the term "psychopathy" has been used by many writers and applied to a wide range of behaviors. As noted earlier, most modern authors have cited Cleckley's (1941/1976) conception of psychopathy, which did not view psychopathic individuals as typically aggressive or antagonistic presumably because the individuals he worked with were middle-class psychiatric patients as opposed to incarcerated criminals (Patrick, Chapter 1, this volume). Others, concerned especially with criminal populations, have described psychopathic individuals as brutally callous exploiters of others. McCord and McCord (1964) were especially prominent and influential advocates of the callous-aggressive aspects of psychopathy, famously characterizing psychopaths as loveless and guiltless in the context of considerable dangerousness.

Reviewing these historical approaches to psychopathy, Patrick and colleagues (2009) employed the term "meanness" to denote the callous–aggressive, antagonistic phenotype. The "triarchic model" advanced by these authors designates three distinct phenotypes that can account for much of the variance associated with the term "psychopathy." This model relates *boldness* and *disinhibition* to the already familiar F1 and F2 dimensions, respectively, and adds a third dimension of *meanness* (see Patrick & Drislane, 2015, for a recent summary). "Disinhibition" in this model refers to the construct summarized earlier in connection with F2. Boldness encompasses features of dominance, emotional resiliency, and venturesomeness, and is presumed to be associated with a low-fear temperament. Meanness entails callous disregard for others, aggressive exploitativeness, and lack of social connectedness. Notably, F1 from the PCL-R and from the PPI share a low-fear component (e.g., as evidenced by the finding of deficient startle potentiation for each), but PCL-R F1 relates more strongly to meanness, whereas PPI-I more strongly represents boldness. In order to reconcile these differing phenotypic expressions of fearlessness, Patrick and colleagues suggest that meanness reflects "a malignant expression of low fear in comparison with boldness" (p. 929). This perspective raises the question of what developmental factors influence whether a low-fear temperament evolves into boldness versus meanness.

#### Summary

Over the past 20 years, our understanding of adult psychopathy has become much richer, based in part on delineation of distinct correlates of the two factors originally seen in the PCL-R and, more recently, the PPI. A deficit in reactivity to threat cues as indexed by fear-potentiated startle is a highly reliable correlate of F1, suggesting that temperamentally based fearlessness is one contributor to the development of that phenotype. Additionally, low anxiety and strong reward-seeking behavior often are associated with this factor. Many personality and psychopathology correlates of the specific variance in F1 are consistent with the fearlessness construct. On the other hand, a broad construct of externalizing disinhibition combined with high negative affect is strongly associated with psychopathy F2, suggesting that an important contributor to this phenotype is a temperament-based deficit in executive control resulting in weak behavioral restraint and poor regulation of negative affect. Finally, Patrick and colleagues (2009) have suggested that the phenotype of meanness is also important for understanding the varied clinical pictures to which the label psychopathy is applied.

# Externalizing Disorders in Childhood and Adolescence

A rich developmental psychopathology literature bears on the development of antisocial behavior. ADHD is central to this topic. Key questions are (1) How does ADHD relate to antisocial behavior?; (2) How many phenotypic dimensions are central to ADHD?; and (3) Which temperament dimensions contribute importantly to these phenotypic dimensions? In this section I review findings relevant to these key questions; in the next major section, I consider how these temperament dimensions relate to adult psychopathy.

#### **Overview of ADHD Phenotypic Dimensions** and Deficits

#### ADHD as Central to the Externalizing Latent Trait in Childhood/Adolescence

There is extensive comorbidity among differing childhood externalizing disorders. For example, Young, Stallings, Corley, Krauter, and Hewitt (2000) found that 30–50% of delinquent youth were diagnosed with ADHD, and at least 50% of those treated for ADHD appeared to follow an antisocial career trajectory. These investigators found both CD and ADHD to be associated with risk of alcohol and substance use in children.

In a twin study focusing on children ages 12-18 years, Young and colleagues (2000) found a broad, highly heritable latent externalizing factor (labeled "Behavioral Disinhibition") that accounted for the comorbidity among CD, ADHD, drug and alcohol dependence, and a measure of disinhibitory personality style (the Novelty Seeking scale from Cloninger's [1987] Tridimensional Personality Questionnaire). ADHD exhibited the largest loading (.68) on this broad factor, with loadings for the other three variables ranging from .40 (Substance Experimentation) to .47 (CD and Novelty Seeking). Interestingly, residual variances for both CD and substance experimentation (i.e., variance remaining after the broad factor was taken into account) showed evidence of shared environmental influence. In addition to being consistent with findings reported by Krueger and colleagues (2002), these results are important in terms of showing that ADHD is strongly related to the common latent factor and for characterizing this latent factor as Behavioral Disinhibition. Additionally, the relatively low loadings for CD and substance experimentation and the common environmental influences for these two diagnoses are indicative of an important contribution of the environment (e.g., family, subculture, and/or deviant peer association; see below). Largely parallel findings were reported by Tuvblad, Zheng, Raine, and Baker (2009) for a younger (9- to 10-year-old) twin sample: A biometric structural analysis of symptom scores for ADHD, ODD, and CD revealed that a predominantly heritable (54% of the variance) common factor (termed "Externalizing Behavior" by these authors) accounted for bivariate correlations among the three disorders.

These findings are consistent with a model in which behavioral disinhibition strongly associated with ADHD constitutes a temperamental risk factor for antisocial behavior, with environmental influences turning the risk into actuality. The relevance of this ADHD-latent disinhibitory factor link to the etiology of F2 is obvious. Indeed, many authors have focused on poor executive control or EF capacities as an important factor in the etiology of ADHD (Frick & Nigg, 2012), as would be expected from theoretical interpretations of the F2 deficit.

#### EF Deficits in ADHD

Willcutt, Doyle, Nigg, Faraone, and Pennington (2005) conducted a meta-analysis of the EF theory of ADHD. EF deficits were associated with ADHD for all tasks reviewed. The largest effects were for tasks measuring response inhibition, vigilance, spatial working memory, and some measures of planning (p. 1342). However, fewer than half of children with ADHD showed a deficit on any specific task reflecting EFs, and the correlations between performance on EF tasks and ADHD symptoms, though significant, were generally small in magnitude. Although the correlation between EF and ADHD scores appears (from family and twin studies) to be attributable to common genetic influences, substantial environmental and genetic effects on ADHD are evident, beyond those promoting poor executive control. Consequently, these authors concluded that EF weaknesses are neither necessary nor sufficient for the etiology of ADHD in all those assigned the diagnosis. Rather, EF deficits may be seen as one contributor to the etiology of ADHD, consistent with the multifactorial etiology to be expected of most developmental disorders. Nevertheless, EF deficits do appear to be implicated in a sizable portion of cases of ADHD. In fact, as we see below, when multiple EF tasks are used to define a latent "response inhibition" variable, the evidence for EF deficits is very strong (Young et al., 2009).

#### Distinguishable Dimensions of ADHD

The foregoing conclusion is consistent with findings from considerable other research demonstrating that there are at least two dimensions of central importance to ADHD. Within DSM-IV (APA, 2000), ADHD was seen as having two symptom dimensions: hyperactive-impulsive and inattentive. These dimensions were used to define three subtypes: predominantly hyperactive-impulsive (ADHD-HI), predominantly inattentive (ADHD-PI), and combined type (ADHD-C). A literature review and meta-analysis by Willcutt and colleagues (2012) found (1) strong support for the concurrent, predictive, and discriminant validity of inattention-disorganization (abbreviated I-D here) and H-I as distinct symptom dimensions and (2) evidence that these dimensions accounted for differences among the nominal DSM-IV subtypes. However, support did not emerge for the subtypes as distinct forms of the disorder with long-term stability, inasmuch as there was (1) poor validity of the ADHD-HI designation after the first grade; (2) minimal support for separating ADHD-PI and ADHD-C based on evidence of etiology, response to treatment, and correlated academic and cognitive functioning; and (3) instability of diagnoses for all three subtypes in longitudinal studies. Thus, the dimensions capture important and valid heterogeneity among those diagnosed with ADHD, but the categorical subtypes are not justified—leading these designations to appear as "presentation specifiers" for the diagnosis of ADHD in DSM-5 rather than ADHD subcategories. Additionally, results from this meta-analytic study point strongly to H-I as the other dimension relevant to ADHD besides executive control/I-D.

Willcutt and colleagues (2012) found that the two dimensions were moderately to highly correlated (r's = .63-.75 across studies), consistent with their frequent co-occurrence as ADHD-C. In addition, the H-I and I-D ADHD dimensions were separable from factors related to symptoms of ODD, CD, and internalizing disorders (consistent with the risk factor model suggested earlier); that is, in studies that examined symptoms of these disorders together with those of ADHD, symptoms comprising the I-D and H-I subdimensions loaded for the most part on factors separate from the factors reflecting symptoms of the other disorders. The only exception was that H-I symptoms in some cases cross-loaded with ODD symptoms, consistent with the importance of poor emotion regulation in both ODD and H-I (see below).

Although both ADHD symptom dimensions are associated with global, social, academic, and adaptive impairment, there are differences in the relative severity of these impairments and important differences in their correlates. I-D symptoms are more associated with shy and passive social behavior, poor adaptive functioning, impaired academic function, and (in adults) global impairment and lower life satisfaction. H-I symptoms are associated with overt rejection by peers and relational aggression-characteristics more relevant to an antisocial trajectory. Similarly, the H-I dimension is more strongly associated with other externalizing disorders than is I-D (see also Frick & Nigg, 2012). By contrast, the I-D dimension, but not the H-I dimension, is associated with neuropsychological impairments, including deficits in general cognitive ability, short-term and working memory, processing speed, vigilance, and response variability-processes clearly more relevant to EF deficits in ADHD. Nigg (2012, p. 529) characterized evidence that the ADHD phenotype has at least a two-dimensional structure as "perhaps the most fundamental advance in ADHD phenotype definition in the last 30 years," but also noted that these symptom dimensions "stubbornly co-occur." I-D appears to resemble the (low) Conscientiousness dimension of the Big Four to some extent, and H-I appears to capture some elements of Big Four Antagonism. However, it is their co-occurrence in ADHD-C that strongly relates to comorbid antisocial behavior and captures many features of the externalizing latent trait relevant to psychopathy Factor 2.

# **Multiprocess Theories of ADHD**

# Executive versus Motivational/Reactive Control Systems

The most prominent applications of temperament theory to understanding ADHD have been provided by Nigg (e.g., 2001, 2005, 2006a, 2006b, 2010, 2012, 2013; Nigg & Casey, 2005; Nigg, Goldsmith, & Sachek, 2004; Nigg, Willcutt, Doyle, & Sonuga-Barke, 2005). Noting that theorists since Gray have embraced motivational and affective processes as characterizing the dimensions of temperament, and drawing in particular on the writings of Eisenberg (e.g., Eisenberg & Morris, 2002) and Rothbart and Bates (1998), along with his own work (Nigg, 2000, 2001), Nigg (2006a) proposed a fundamental distinction between *reactive* and effortful control-characterizing these as reactive incentive response systems versus regulatory processes (2006a, p. 412) or, with respect to inhibition, as motivational versus executive inhibition (Nigg, 2001). This model includes two basic incentive systems, approach and withdrawal, along with a separate regulatory system. The reward-approach system responds to cues for potential reward (Nigg, 2006a) as described earlier for the BAS, whereas the withdrawal system is driven by anxiety, fear, or uncertainty (Nigg, 2001, p. 576; i.e., both anxiety and fear are included in withdrawal). The model's distinction between reactive and regulatory control parallel's Kahneman's (2011) two-systems model and Mischel and colleagues' (Metcalfe & Mischel, 1999; Mischel & Ayduk, 2004) contrast of hot versus cool systems as discussed earlier.

The notion that behavioral control is duplicated in reactive and regulatory or executive control systems is new relative to earlier applications of Gray's BIS. Nigg characterizes these systems as exerting "bottom-up" (limbic) and "top-down" (cortical) control, respectively. Because of the importance of inhibition for ADHD (Nigg, 2001) and EF capacities (Barkley, 1997, 2003; Nigg, 2001), these two forms of inhibitory control are especially important. The regulatory system does more than inhibit inappropriate behavior, however. It can facilitate approach behavior in contexts in which reward incentives are weak (e.g., completing a boring vigilance task, engaging in exercise for future fitness/health gains; Nigg, 2001; Valiente et al., 2003), and it regulates emotion and emotional expression. Elsewhere, Eisenberg and colleagues (2010) have emphasized that executive control can reduce the intensity of both externalizing and internalizing emotions.

# *Control Systems and Self-Report Temperament Phenotypes*

Nigg (2006a) views withdrawal and regulatory systems as roughly mapping onto the familiar three- and four-factor temperament models: Extraversion (approach), Neuroticism (withdrawal), and Constraint, with constraint subdivided into Conscientiousness and Agreeableness. Nigg suggests that constraint reflects both reactive and executive control, but reactive control also relates to both approach and withdrawal; that is, reactive control is a broad trait that "represents a blend of incentive processes" (p. 403). Although effortful control is related to Constraint, it is more specifically related to Conscientiousness and to executive control. Nigg also cites the importance of affiliation to Agreeableness (p. 399)-a point relevant to meanness (see below). The importance of Constraint for both the externalizing trait associated with F2 and the executive control deficit in

ADHD underscores the relevance of this ADHD deficit for the etiology of psychopathy Factor 2.

#### Executive Control and Inattention– Disorganization

In a recent overview of research on ADHD, Nigg (2013), like others before him, suggested that the I-D symptom dimension may reflect defective topdown executive control of thoughts, emotions, and behavior; that is, the EF deficits documented for ADHD by Willcutt and colleagues (2005) are associated primarily with the I-D dimension. The largest effects in the literature on executive control in ADHD are found for weakness in response suppression or executive inhibition and for spatial working memory. Response suppression deficits are especially reflected in performance on the go/ no-go task, the anti-saccade task, and the stop-signal task—tasks viewed as reflecting EFs.

#### Reactive Control and H-I

Martel, Nigg, and von Eye (2009) examined the H-I and I-D symptom dimensions (assessed via teacher ratings) in ADHD and control children ages 6-12 years and adolescents ages 13-18. Parent ratings were used to index Eisenberg's dimensions of reactive control, resiliency (flexible response to contextual demands), and NEM, as well as the Big Five dimensions of Neuroticism, Agreeableness, and Conscientiousness. The stop-signal task and the Trail Making Test B were administered as measures of executive control. A structural equation model yielded the desired two-factor model in both groups. The top-down latent variable was defined as expected by Conscientiousness, Resiliency, Response Inhibition (stop-signal task), and Set-Shifting (Trails B); the bottom-up latent variable was defined by good Reactive Control, low Neuroticism, low Negative Emotion, and Agreeableness. In both samples, scores on the top-down latent variable were correlated negatively with I-D (r = -.47 in both samples), and scores on the bottom-up latent variable were correlated negatively with H-I (r = -.57 in children, -.48 in adolescents). These associations were specific in the child sample, but the top-down factor correlated secondarily with H-I in the adolescent sample (r = -.25), a finding the authors suggested might reflect a contribution of EF dysfunction to H-I symptomatology due to the the dramatic development of top-down neural pathways in adolescence. The two latent factors were highly correlated (r = .85 in children, .72 in adolescents)—consistent with their co-occurrence in ADHD-C. These results indicate that reactive control, as measured by Eisenberg and colleagues (2003), contributes significantly to the H-I dimension of ADHD. The finding of a top-down, executive control latent factor is clearly consistent with the contribution of poor executive control to both ADHD and psychopathy F2.

An alternative formulation would be that poor executive control was involved in both dimensions in this study, and it loaded on the two separate (but correlated) factors because it was intertwined with emotional and motivational factors where H-I was concerned, and with various cool functions where I-D was concerned. This explanation parsimoniously attributes the lack of behavioral restraint in H-I and the EF deficits in I-D primarily to poor executive control. A weak BIS might well also contribute, but since the BIS has not emerged as a clear contributor to either ADHD or to F2, presumably it would contribute secondarily.

First, a number of lines of evidence support a contribution of executive control to motivational (reactive) inhibition. Rothbart and colleagues (2001) found that a measure of inhibitory control (cf. motivational inhibition) exhibited positive loadings (+0.49, +0.70) on the effortful control factor of Rothbart's temperament inventory, and Nigg (2006a) reported that Rothbart's effortful control factor and Eisenberg and colleagues' (2003) measure of reactive control both correlated above 0.6 with Conscientiousness and with each other more modestly  $(r \sim .4)$ . Elsewhere, Eisenberg and colleagues found that executive control and reactive control measures correlated with one another at a median level of r = .48, with each correlating in turn with performance on an executive control task at r = .23. Thus, measures of reactive and executive control correlate with each other and both correlate in turn with indices of executive control (Conscientiousness, an executive control task), consistent with a contribution of variations in executive control to measures of reactive control.

Second, the contribution of executive control to both dimensions of ADHD, as well as to CD and substance use, was strongly supported by the results of biometric modeling analyses of data from an adolescent twin sample at ages 12 and 17 (Young et al., 2009). These authors evaluated relations between latent variables of (1) *behavioral disinhibition*, the factor in common among measures of substance use, ADHD, CD, and novelty seeking, and (2) *response inhibition*, the factor shared among task measures of EF (i.e., antisaccade, Stroop, stopsignal). The phenotypic correlation between the latent behavioral disinhibition and latent response inhibition variables was -.47 at age 12 and -.39 at age 17. Of special importance in this context, variations in response inhibition did not differentially impact I-D as compared to H-I symptoms, indicating that executive control deficits apply to both H-I and I-D symptoms and suggesting that Eisenberg and colleagues' (2003) measure of reactive control contains executive control variance. The authors attributed their clear evidence for the importance of executive control to all aspects of ADHD to the use of three tasks to define a latent executive control construct.

Third, Eisenberg and colleagues' (2003) reactive control scale appears to index global inhibition versus impulsivity-the items refer simply to "overcontrol" and "undercontrol," without any distinction between reactive and executive control. Their basis for viewing the scale as specifically a reflection of reactive control appears to rest on an assumption that over- and undercontrol are both maladaptive, and that executive control is inherently adaptive (e.g., Eisenberg et al., 2003, 2010; Valiente et al., 2003). However, executive control may not always be perfectly adaptive (i.e., sensitivity to distal threat cues associated with high executive control might produce overcontrol). Indeed, cognitive theories of depression and anxiety suggest that executive control can be maladaptive in this way, as does the Gray and McNaughton (2000) view (cited earlier) that excessive cognitive/attentional focus on potential threats produces excessive activity in the SHS in GAD. At the other end, poor executive control would contribute strongly to maladaptive impulsivity or undercontrol.

In summary, it seems likely that executive control contributes to measures of reactive control used in this literature and may therefore contribute strongly to the impulsivity associated with H-I. While a weak BIS may contribute secondarily, there is little clear support for this BIS contribution compared with the extensive support for executive control deficits.

# DA, the BAS/Approach System, and ADHD

Given the central position of H-I in ADHD, investigative interest naturally has focused on the reward-approach system—in addition to any possible inhibitory deficits. This interest has been strengthened by the central role of DA in this system and the fact that methylphenidate (a primary pharmacological treatment used for ADHD) is a DA agonist whose primary mechanism of action is to increase DA activity in the striatum, a key structure in the mesolimbic reward system (Neuhaus & Beauchaine, 2013). The behavioral excess in H-I traditionally was attributed to a strong rewardapproach system and greater DA activity (Neuhaus & Beauchaine, 2013), but the effects of mythylphendiate suggest deficient DA activity. This latter hypothesis is consistent with an impressive array of findings (e.g., Beauchaine & McNulty, 2013; Neuhaus & Beauchaine, 2013), including a major review (Plichta & Scheres, 2014) that found that the ventral striatum response to the anticipation of rewards is reduced among those with a diagnosis of ADHD. Most theories attempt to reconcile this apparent contradiction by suggesting compensatory mechanisms in which low DA produces greater behavioral activation, albeit in a less than optimal fashion.

For example, Beauchaine (e.g., 2001; Beauchaine & McNulty, 2013) concluded that impulsivity in ADHD reflects reward insensitivity (consistent with low DA in the mesolimbic circuit). He proposed that low reward sensitivity is associated with low positive affect that, in turn, releases negative affect and irritability. The aversiveness of this negative affectivity causes "increased impulsive and perseverative responding to up-regulate a chronically aversive mood state" (Neuhaus & Beauchaine, 2013, p. 203; see also Beauchaine & McNulty, 2013) through pursuit of intense rewards. Thus, phenotypically, there is excessive (but often inappropriate) reward-seeking behavior, even though the underlying cause is low reward sensitivity.

Sikström and Söderlund (2007) proposed an interesting variation on this theme. In their view, low *tonic* extracellular DA causes autoreceptors to up-regulate the *phasic* release of DA in response to environmental stimulation. This up-regulation causes hypersensitivity to relevant environmental stimuli that compensates for the low tonic DA in moderately arousing (optimal) environments, but fails to do so in understimulating and overstimulating environments. Phenotypically, there is excessive behavioral activation under highly stimulating conditions and underactivity in minimally stimulating conditions.

Relatedly, Corr and McNaughton (2015) proposed that impaired functioning of the DA system in externalizing disorders (including substance abuse) produces a "reward deficiency syndrome." A deficiency in cortical DA impairs goal selection, resulting in a smaller number of goal choices. At the same time, the reduced cortical DA impairs the cortical modulation of subcortical DA. Consequently, for those goals that are selected, reward-related stimuli more directly control behavior. This unrestrained BAS response to rewards can result in abnormal behavior such as impulsivity and drug taking. These authors characterize this deficiency as increased BAS (approach) responding. While BAS output is quantitatively increased, adaptive response selection is decreased. They emphasize the complexity of DA effects in terms of influencing many neural pathways and behavioral functions-making it difficult to establish clear effects of DA on ADHD, CD, and psychopathy.

Some approaches hypothesize a causal connection between the DA dysfunction and poor executive control in ADHD. In the most prominent theory, Beauchaine and McNulty (2013) suggested that very early trait impulsivity can result from low mesolimbic DA activity, and that early impulsive behavior, in turn, can alter the later neurodevelopment of brain regions responsible for EFs. Furthermore, with development of the prefrontal cortex, deficient mesocortical DA contributes to deficient executive control. Corr and McNaughton (2015) state that impaired DA transmission early in development can have negative effects on the later development of the frontal components of the BIS. Thus, in these theories, a DA deficiency can causally contribute to EF deficits, making the DA deficiency central to the etiology of ADHD and strongly correlated with EF deficits. Interestingly, Beauchaine's emphasis on negative affect and irritability as a consequence of low DA levels is consistent with the picture of strong negative affect and irritable/reactive aggression associated with psychopathy Factor 2.

These three proposals (Beauchaine, 2001; Corr & McNaughton, 2015; Sikström & Söderlund, 2007) have in common the hypothesis of a primary deficiency in DA combined with some type of compensatory process that results in high rates of often nonoptimal or maladaptive reward-approach behavior. The appetitive behavior may be either excessive or insufficient, depending on conditions.

That this picture does not characterize all children with elevated H-I symptoms is indicated by a recently reported subtype of ADHD (34.4%), termed "surgent," which phenotypically appears to reflect strong approach motivation (Karalunus, Fair, Musser, Aykes, Iyer, & Nigg, 2014), along with a mild subtype (25.9%) and an irritable subtype (39.7%). The surgent subtype was characterized as impulsive and low on shyness, and high on dominance, high-intensity pleasure seeking, and activity level. The features of this group appear consistent with a strong reward-approach orientation. Individuals of this type would be expected to differ from subjects with deficient-DA ADHD in exhibiting high positive affect—as opposed to high negative affect and irritability (Neuhaus & Beauchaine, 2013). Although the authors provide no information on this point, it seems likely that this surgent subtype overlaps considerably with the low fear/F1 subtype of ADHD discussed below. It is also possible that some surgent individuals have an EF deficit and represent a normally functioning reward-approach F2 pathway to ADHD, albeit with less prominent NEM.

It is difficult to know how to integrate this deficient DA hypothesis into a coherent overall theory (Nigg, 2013). As noted, the presence of high NEM is consistent with the F2 pathway for psychopathy. Similarly, the lack of evidence in adults that F2 is associated with high levels of adaptive appetitive behavior (e.g., social dominance) appears consistent with this picture. The proposal that DA dysfunction has adverse effects on the development of EFs, and acts to compromise EFs once they develop, would mean that the DA dysfunction contributes both to poor executive control and to aberrant responses to rewards. The key question to be resolved is whether DA dysfunction should be viewed as the major etiological factor accounting for most of the variance in the H-I, high-NEM, irritable F2 pathway, or whether it is one of several contributors. Under the assumption that deficient DA is unlikely to be the only contributor to deficits in executive control and high NEM, then deficient DA is likely to be one of several contributors, albeit an important one. Examination of DA functioning in adults with externalizing disorders would provide valuable information concerning the contribution of deficient DA to the F2 pathwav.

#### Summary and Comment

The latent externalizing/disinhibitory trait dimension is evident in both adults and children and is clearly implicated in the symptomatology of ADHD. A meta-analysis of EF studies of ADHD by Willcutt and colleagues (2005) revealed deficits on all tasks reviewed, with behavioral inhibition among the tasks exhibiting the greatest deficits. Subsequent work by Young and colleagues (2009) demonstrated a latent construct of response inhibition to be the strongest contributor to ADHD among differing types of EF capacities.

H-I and I-D constitute two highly correlated dimensions that account for most of the phenotypic variance among DSM-IV ADHD subtypes. The I-D dimension is common to the two major subtypes, with hyperactivity as the basis for distinguishing between them. The I-D dimension entails deficits in EFs or executive control and relates to the personality dimensions of effortful control, Constraint, and Conscientiousness. It appears to correspond to the impulsive-unrestrained component of the general disinhibitory factor associated with the externalizing spectrum in work by Krueger, Patrick, and colleagues. The H-I dimension, on the other hand, encompasses high NEM, hostility, and impulsivity (attributed to poor reactive control in Martel et al. [2009] but suggested earlier to be due to poor executive control). It is suggested here that this symptom dimension is more likely to reflect poor executive control intersecting with high NEM and hostile antagonism (including angry aggression and low affiliation) than poor motivational control (a weak BIS). These features parallel the findings of high NEM, impulsivity, and angry aggression in F2 that also characterize the general externalizing proneness dimension. Phenotypically, it is the combination of I-D and H-I (ADHD-C) that is strongly comorbid with antisocial behavior-possibly because elevated scores on both dimensions indicate a greater deficit in executive control than is inherently associated with the H-I dimension alone, or because the addition of high NEM promotes antisocial behavior.

Thus, it appears that ADHD-C comorbid with CD, entailing a combination of high NEM and deficient executive control, is the antecedent to the F2 pathway to psychopathy. It also appears likely that a dysfunctional reward-approach system secondary to low DA contributes importantly to impulsive tendencies associated with ADHD-C. On the other hand, the identification of a surgent subtype with a strong reward-approach system suggests a somewhat smaller subgroup that exhibits impulsiveness due to a strong approach orientation combined with poor inhibitory control. It is quite conceivable that these individuals would not be characterized by high NEM and thus would not fit the usual prototype for the F2 psychopathy pathway (see below).

# Fledgling Psychopathy Two Major Pathways in Childhood

The childhood diagnosis of CD is a natural precursor to psychopathy in adults, but subtype distinctions are important to identify in youth with CD those at greatest risk for later psychopathy. One crucial subtype distinction is childhood versus adolescent age of onset (Frick & Nigg, 2012; Frick & Viding, 2009), proposed initially by Moffitt (1993). The adolescent-onset CD group show few deficits, little evidence of temperament contributions to their antisocial behavior, and are less likely to show continued antisocial behavior into adulthood (e.g., Frick, Blair, & Castellanos, 2013). Consequently, they are of less interest with respect to the etiology of psychopathy. Members of the highly relevant childhood-onset group show deficits in executive control, attention, IQ, and emotional regulation, are more impulsive, and come from more dysfunctional families (e.g., marked by instability and conflict, less effective parenting strategies; Frick et al., 2013; Frick & Viding, 2009).

Within the childhood-onset group, there are two important ways of identifying further subtypes. First, Lynam's (1996) influential review (see also Moffitt, 1993) employed the useful term "fledgling psychopath" and proposed that ADHD, when comorbid with CD, identifies a unique subtype that is more likely to progress into later psychopathy. In connection with the ADHD diagnosis, Lynam emphasized hyperactivity, impulsivity, and inattentiveness as characteristics of this group (cf. ADHD-C). According to his review, this subgroup has an early onset of antisocial behavior; shows more frequent, varied, and severe antisocial behavior across settings (e.g., school and home); and is more likely to persist in antisocial behavior over time. Lynam suggested that the ADHD + CD group shows deficits on laboratory tasks that parallel those seen in adult psychopaths, along with frontal lobe/EF deficits on neuropsychological tests. Additionally, he cited Douglas's (1988; see also Douglas, 1999) notion of a deficit in self-regulation in ADHD as reflecting the nature of the deficit in ADHD + CD, and he identified a disposition akin to (low) MPQ Constraint as capturing the core deviation in this group.

Lynam's conceptualization of the ADHD-CD deficit as entailing weak executive control or selfregulation, reflected in poor inhibition of rewarded behavior and low MPQ Constraint, maps onto the disinhibitory–executive control externalizing deficit associated with F2 and with ADHD. Notably, Lynam (1996) made no reference to fearlessness and excluded thrill seeking as important to this subtype—features of psychopathy often seen as important to F1.

The second approach to subtyping is Frick's callous-unemotional (CU) traits conception-encompassing deficient empathy, absence of guilt, shallow emotionality, and unconcern about performance in differing contexts (in this volume, see Frick & Marsee, Chapter 19, and Viding & Kimonis, Chapter 7)—and represented now by a specifier for the diagnosis of CD in DSM-5 (APA, 2013). The high-CU subtype of CD is reasonably large, with prevalence estimates in antisocial or CD-diagnosed samples of youth ranging from 13 to 46%. In a major review of research on the CU concept, Frick and White (2008) reported that CU tendencies show appreciable stability over time, especially when assessed via parent ratings, and are associated with a more stable and aggressive course with earlier onset of delinquency. Additionally, high CU scores in childhood predict psychopathy in adulthood, even after researchers control for level of childhood antisocial behavior, and among youth diagnosed with CD, those high in CU tendencies engage in greater aggressive behavior of both proactive and reactive types than those low in such tendencies (Frick et al., 2013; Frick & White, 2008). Furthermore, studies have consistently found that subjects with high CU exhibit deficits in the processing of negative (but not positive) emotional stimuli, including reduced sensitivity to cues for punishments, especially when seeking rewards. High CU scores are also positively correlated with personality measures of fearless or thrill-seeking behaviors and negatively correlated with trait anxiety and NEM (particularly when controlling for concomitant levels of impulsive-unrestrained behavior).

Frick and White (2008) contrasted the CU subtype with youth selected for early-onset, severe conduct problems who were not high in CU features. The low-CU early-onset CD group showed high levels of impulsivity and anxiety, were highly reactive to emotional stimuli, tended to show a hostile attribution bias in social situations (i.e., interpret ambiguous behavior as hostile), were more likely to have low verbal IQ, and more often came from families with dysfunctional parenting. Other work indicates that individuals of this type tend not to show the deficits in empathy and guilt associated with the CU subtype (Frick et al., 2013, p. 84), and have problems regulating emotion. As such, this group appears to have many of the features described by Lynam (1996) that are associated with F2 and were reviewed earlier in connection with the ADHD-C diagnosis. Thus, subtyping childhood-onset CD on the basis of CU traits appears to contrast a low-fear temperament contribution on the one hand, with a temperament disposition entailing weak emotional control and poor EF on the other.

Given the perspectives just summarized, it might be expected that individuals with comorbid ADHD-C + CD would correspond to the subtype described by Lynam (1996). However, the vast majority of children with childhood-onset CD, especially in clinic-referred samples, show comorbid ADHD + CD (e.g., Frick et al., 2013). Consequently, ADHD is comorbid with both high-CU and low-CU subtypes. The likely explanation is that clinical ratings of H-I in ADHD can derive from poor emotion regulation/poor executive control (both primarily non-CU) and from a lack of concern for consequences due to fearlessness associated with high CU traits (P. Frick, personal communication, September 2, 2014). This lowfear-based ADHD variant may well exhibit impulsive behavior due to a weak BIS (a conclusion also reached by Corr & McNaughton, 2015).

A study by Musser, Galloway-Long, Frick, and Nigg (2013) addressed this potential heterogeneity by subdividing 75 children from a community sample who met ADHD-C criteria alone (excluding comorbid CD) into a high-CU versus low-CU group, along with 75 controls. Based on physiological indices of parasympathetic activity (respiratory sinus arrhythmia [RSA]) and sympathetic activity (preejection period [PEP]) during baseline and emotion-induction procedures with film clips, the authors found that the high CU ADHD-C group showed low levels of tonic autonomic arousal, whereas the low-CU ADHD-C group showed elevated tonic sympathetic arousal and exhibited difficulty in regulating emotional responses, especially to positive stimuli. Thus, the latter group showed reactivity consistent with the previously noted portrayal of the ADHD-C subtype as having poor emotion regulation with high NEM. In contrast, the high CU ADHD-C group showed the low arousal expected of the CU construct but not characteristically reported among those with an ADHD-C diagnosis. Thus, children with low CU ADHD-C show impulsive-unrestrained behavior (cf. disinhibitory-executive control deficit), and children with high CU ADHD-C show low arousal (cf. low fear) even without comorbid CD (i.e., both tendencies are seen in an ADHD-C sample and are not secondary to CD, consistent with contributions of both temperaments to AD-HD-C).

To summarize, the more severe antisocial behavior likely to be characteristic of fledgling psychopathy is seen among those with childhoodonset CD and is associated with the ADHD-C subtype. Subtyping members of this group with childhood-onset ADHD-C + CD on the basis of CU traits appears, to a significant degree, to parallel the two psychopathy factors, with the high CU subtype exhibiting features associated with F1 and the low-CU subtype more resembling the features of F2.

The possible association of the H-I dimension in ADHD with a poorly functioning reward-approach system suggests additional perspectives. First, a dysfunctional reward-approach system may be one path to impulsivity that characterizes a distinct (and relatively large) subgroup among those diagnosed as ADHD-C. Second, an early DA deficiency may promote both poor executive control and dysfunctional reward-approach. It remains unclear to what extent this combined deficit is associated with psychopathy, inasmuch as there is no clear parallel in the adult literature in connection with F2 (i.e., no documented DA deficit). On the other hand, if the DA deficiency does produce poor executive control, it should constitute a major pathway to F2 psychopathy. Furthermore, the general ineptness of behavior associated with F2 is not inconsistent with a dysfunctional reward-approach system, and the high NEM and irritability said to be associated with the poorly functioning rewardapproach system fits well with F2 features. Finally, it remains unclear what portion of this F2 pathway to ADHD is associated with a dysfunctional reward-approach system versus a normal to strong reward-approach system.

# **Developmental Trajectories to Psychopathy**

The CU versus poor emotional regulation distinction in childhood-onset CD appears to parallel major features of the two psychopathy factors, as described earlier. Frick and his colleagues (Frick & Morris, 2004; Frick et al., 2013; Frick & Viding, 2009) have described the developmental trajectories for these two CD subtypes. A long tradition in the developmental literature has linked the concept of "difficult temperament" in infants with increased risk of early-onset and stable conduct problems. Since an infant can be "difficult" in various ways, the construct of difficult temperament subsumes a number of dimensions of reactivity and regulation, but Frick and Morris (2004) focused on two that have been the object of an extensive body of research: poor emotion regulation and a fearless temperament with CU features—characteristics relevant to psychopathy F2 and F1, respectively.

### The Poor Emotion Regulation Pathway

Emotion regulation influences many aspects of emotion and involves control of attentional and inhibitory processes that enable control of both the expression of the emotion and the intensity of the experienced emotional state. Frick and Morris (2004) highlighted the previously mentioned distinction between the voluntary or effortful process of emotion regulation versus passive or involuntary reactivity. The involuntary reactivity includes separate temperament dimensions of sensitivity to (1) cues for reward and positive stimuli and (2) cues for punishment and negative/threatening stimuli (Gray, 1982). Although negative emotions including anxiety, fear, anger, irritability, and distress covary to form the higher order temperament construct of FFM Neuroticism or MPQ NEM, Frick and Morris (2004) noted that anger/frustration/irritability are more strongly related to conduct problems, whereas anxiety/fear/ sadness are more strongly related to internalizing problems, and suggested that different neurological substrates may be associated with the two subgroups of negative emotions. They also noted that emotion regulation is a component of effortful control or executive control, and that EF deficits also are strongly associated with conduct problems and aggression. Thus, a broad deficit in EFs is associated with the risk of antisocial behavior in this developmental pathway.

The potential negative developmental trajectory for the poor emotion regulation subtype has been described in numerous articles (e.g., Frick & Morris, 2004; Frick et al., 2013; Frick & Viding, 2009; Moffitt, 2003). It begins with a deficit in executive control or emotion regulation, which makes the infant difficult and challenging to parent. Skilled parents may well be able to meet this challenge with a benign or even positive developmental outcome. For unskilled parents, however, there is a risk of a dysfunctional transactional or bidirectional process that produces an adverse trajectory. Low verbal IQ and other factors (e.g., broken homes, financial distress, poor schools) may contribute to the negative outcomes. Among the casualties are the failure to improve EFs, including emotional regulation, and to acquire social skills. As a result of poor executive control and emotional regulation and poor parenting, the child engages in impulsive and aggressive behavior and other antisocial acts characteristic of ODD. The consequences are poor social relations with the family, peers, and teachers, and poor performance in school. Peer rejection undermines opportunities to develop social skills and increases the likelihood of association with deviant peers, providing an environmental context that further supports antisocial and aggressive behavior. Thus, a difficult temperament combines with unskilled parenting and other disadvantages to produce a transactional process of developmental failure that eventually extends to school and peer groups, often resulting in deviant peer association.

The general picture just presented is consistent with (and partially based on) classic work by Patterson, Reid, and Dishion (1992) on the coercion process in early mother-child interactions. Patterson, DeGarmo, and Knutson (2000) examined this model in the context of comorbidity between ADHD and CD. A high-risk sample of 206 families and their fourth-grade boys (age 10) were recruited from 10 schools with high arrest rates. Multimethod assessments from different data sources were used to define latent constructs in a structural equation model. The major results were that (1) the correlation between hyperactivity and antisocial behavior was attributable to poor parental discipline, (2) parental antisocial features contributed to boys' antisocial behavior but not to their hyperactivity, and (3) when boys' antisocial behavior was controlled, hyperactivity did not predict later early-onset delinquency.

Based on these data and a review of other studies, the authors proposed the following model. An extremely active and difficult infant characterized by noncompliance and irritability interacting with a nonresponsive caretaker initiates a process that quickly escalates. By 2 years of age, the at-risk toddler may have become both coercive and socially unskilled, characteristics of both the hyperactive and the antisocial child. By ages 2–4 years, the child may be labeled as hyperactive. The noncompliance and poor social skills contribute to school failure and peer rejection. A family that permits or even supports antisocial child, whereas a family that does not condone antisocial behavior can prevent hyperactivity from evolving into antisocial behavior. Deviant peer association provides further important training in antisocial behaviors, and poor parental supervision further permits the antisocial trajectory. Note that the suggestion that family characteristics influence antisocial behavior is consistent with the previously discussed contribution of common environment to antisocial behaviors.

Kochanska and Kim (2012) provided an important addition to this model, showing that security of attachment experienced by infants is an important moderator of the pathway from temperamental anger/irritability through coercion to antisocial behavior. In an initial study, infants' attachment security was measured at 15 months (separately for mothers and fathers), along with angry temperament at 38 months, the mothers' and fathers' power-assertive control style at 52 months, and children's antisocial outcomes at 80 months. The traditional expectation is that angry temperament elicits parental power-assertive control that, in turn, leads to the child's antisocial behavior; that is, the link between angry temperament and later antisocial behavior is mediated by parental power assertion (consistent with Patterson's coercion process). However, this trajectory was only true in the case of infants with insecure attachment. For infants with secure attachment, infant anger did not predict mothers' power assertion, and mothers' power assertion did not predict an antisocial outcome. The same pattern was found separately for fathers. In a second study that focused only on mothers, highly similar results were obtained. Interestingly, children's ability to resist temptation in the first study (an EF, assessed by not peeking while a gift was being wrapped, or not opening a wrapped gift) showed a parallel result: Only in insecurely attached children did infant anger predict parental coercion that, in turn, predicted compromised ability to delay.

In attempting to explain the process whereby security of attachment altered the child's response to coercive parenting, Kochanska and Kim (2012) suggested that, with secure attachment, the child would view the coercive parenting as "well intentioned, legitimate, and benevolent," whereas insecure children would perceive the coercive parenting as "hostile, unfair, threatening, and mean spirited" (p. 802). Furthermore, they suggested that insecure children's response to coercive parenting would be anger, resentment, and a rejection of parental influence.

#### The Fearless Temperament Pathway

The second major pathway to psychopathy involves a fearless temperament. This summary is taken from Frick and Viding (2009). The starting point is a fearless and uninhibited temperament that makes a child more difficult to socialize. Results relevant to this challenge to parenting come from Kochanska's (1993, 1995, 1997, 2002) dramatic findings of an interaction between temperament and parenting for paths to internalization of conscience. Using a measure of temperamental fearfulness and a dimension of parenting with maternal gentle discipline (good disciplinary style) at one end and power assertion (bad discipline) at the other end, Kochanska (1995, 1997) found that, for children scoring in the fearful (high 50%) range on this measure, maternal gentle discipline predicted internalization of conscience. These more fearful children were seen as responding to gentle discipline with sufficient anxiety to promote learning of conscience, whereas the fearless children responded with insufficient anxiety. On the other hand, for the fearless 50% of the children, a mutually positive mother-child relationship (a secure attachment) predicted internalization of conscience. The latter is presumably a reward-based pathway that does not require anxiety to promote conscience-an alternative effective developmental pathway for fearless children. Further evidence pointing to the importance of a mutually positive mother-child relationship for the internalization of conscience in relatively fearless children was obtained in two other longitudinal studies (Kochanska, Aksan, & Joy, 2007).

Frick and Viding (2009) cited a study by Cornell and Frick (2007) in which fearless/uninhibited children developed feelings of guilt and empathy only when parental discipline was consistently rule-and obedience-oriented. This finding suggests another style of parenting that can be effective, in which firm and consistent discipline is implemented without the counterproductive features of the power assertion assessed by Kochanska. Frick and colleagues (2013) also cited a proposal by Blair (1995; Blair, Colledge, Murray, & Mitchel, 2001) that empathy is learned as a result of a biologically prepared negative emotional response to distress cues in others. Through conditioning, the child learns to inhibit behaviors that produced this distress, thereby developing an empathic orientation. Children with a fearless/uninhibited temperament are less likely to experience this negative arousal and are therefore less likely to develop empathy. The key point is that fearless temperament sets the stage for a failure to develop empathy and guilt, the primary features of the CU dimension. In contrast, children following the poor emotion regulation path to antisocial behavior typically do not manifest problems in empathy and guilt, and experience distress in connection with the negative consequences of their behavior for others (Frick et al. 2013, p. 84). Thus, the presence or absence of CU traits represents an important difference between these two developmental paths to antisocial behavior.

In addition to the foregoing, Nigg (2006a) suggested that a disposition toward low affiliation (empathy) should be considered as a further contributor to the low-fear pathway to psychopathy. Low affiliation is expected to be associated with indifference toward the suffering of others and should thereby facilitate instrumental aggression. As noted earlier, affiliation is an important component of the Big Five temperament dimension of Agreeableness. Nigg also notes that affiliation relates to Extraversion.

Along similar lines, Depue and Morrone-Strupinsky (2005) discussed affiliation as a major neurobehavioral system. Like Nigg (2006a), they note that Big Five Agreeableness incorporates the social closeness and social cooperation components of affiliation (p. 316). However, they view affiliation as a component, along with agentic extraversion, of the higher-order dimension of Extraversion-rather than an expression of Constraint, as was suggested for Agreeableness earlier. For example, MPQ PEM breaks into dimensions of agentic extraversion and communal extraversion, the latter reflecting variations in social closeness. In any event, the key point is that individual differences in a major neurobiological dimension of affliliation could contribute importantly to the development of callousness and lack of empathy (e.g., when combined with low fear or with angry resentment over loveless, coercive parenting). Consistent with this hypothesis, Depue and Morrone-Stupinsky (2005) concluded that the neuromodulator oxytocin contributes to affiliation, and it has been proposed that low levels of circulating oxytocin are associated with the CU dimension of psychopathy (Dadds et al., 2014).

#### Meanness

As noted earlier, the triarchic model proposes meanness as a distinct facet of psychopathy, in addition to disinhibition and boldness, characterizing it as a malignant expression of fearlessness. Other descriptors of meanness include lack of affiliative capacity, deficient empathy, exploitativeness/predation/proactive aggression, cruelty, arrogance, disdain for authority, antagonism, and guiltlessness. In Krueger and colleagues' (2007) model of the externalizing spectrum, the subordinate factor of callous aggression (meanness) was delineated by scales indexing callousness, relational/proactive and destructive aggression, excitement seeking, rebelliousness, and dishonesty.

For the most part, these descriptors are consistent with the characterization of meanness as a malignant expression of boldness. Boldness is conceptualized as reward seeking without restraint by fear, compatible with arrogance, defiance, exploitativeness, emotional insensitivity, and excitement seeking. Logically, at least two additional variables are needed to account for the highly antisocial aspects of meanness. The first is a lack of concern for adverse effects of one's actions on other people, which would be consistent with poor attachments and concomitant lack of empathy. This indifference to others would allow the reward seeking to expand into exploitativeness/predation/proactive aggression, guiltlessness, mild callousness, and perhaps dishonesty. The second variable is resentment and active hostility (antagonism) toward others, which could promote cruelty, destructive aggression, rebelliousness, and severe callousness.

With regard to the fearlessness pathway, Frick and colleagues' (2013) pairing of callousness with lack of emotion in the CU construct connects clearly with the meanness construct. They attributed the development of callousness to the failure to internalize conscience among fearless children in the absence of a mutually positive mother-child relationship (insecure attachment), as described by Kochanska (1993). Generally, Kochanska includes empathy as part of internalized conscience and moral development. Consequently, this pathway would account for poor attachments and lack of empathy (i.e., poor attachment combined with fearlessness tends to lead to a lack of empathy). Consistent with this perspective, Pardini (2006) presented findings from a study of adjudicated juvenile males and females, indicating that fearlessness represents a risk factor for callousness and severe violence. A mediational model revealed evidence of a path from fearlessness to lack of punishment concern to callousness to severe violence. Thus, fearfulness contributed to callousness through its association with lack of concern for punishment, and callousness in turn was predictive of increased violent behavior. Findings from this study provide compelling evidence for fearless temperament as a risk factor for meanness.

Although focused on infants with an angry temperament, Kochanska's more recent research (described earlier) points to a combination of insecure attachment (a stand-in for absence of a mutually positive mother-child relationship) and subsequent power-oriented parenting for producing an antisocial trajectory. Her suggestion that such children are liable to see parents' coercion as hostile, unfair, threatening, and mean-spirited, and as a consequence respond with greater anger, resentment, and rejection of parental influence, provides a clear pathway for the development of anger, resentment, and active hostility toward others. Thus, a failure of early attachment in children with a fearless temperament promotes a lack of empathy and, when accompanied by a powerassertive control style on the part of parents, increased resentment, hostility, and antagonism. Presumably more severe coercive parenting would contribute to more severe meanness.

Based on Kochanska's work, the infant with an angry temperament is equally affected by the combination of insecure attachment and powerassertion parenting. Consequently, it is conceivable that meanness/callousness is associated to some extent with this F2 pathway, albeit without the emotional coldness associated with fearlessness. Additionally, as suggested earlier, individual differences in a temperament dimension of low affiliation could exacerbate the callousness and meanness associated with either pathway. If so, this contribution could help to account for severe instances of meanness.

# General Summary, Discussion, and Speculations

In attempting to conceptualize contributions of temperament to psychopathy, four biobehavioral dimensions are commonly cited. These include the three systems described by Gray—BAS or rewardapproach, BIS, and fear—and the more recent executive control system. Attributing phenotypic variance to these systems is problematic because of interactions among them, but considerable progress has been made in spite of this ambiguity. In the adult psychopathy literature, two major dimensions have been documented, relating to the specific variance in F1 and F2, and these findings are consistent with the childhood literature. The closing sections consider both simple and more complicated etiological hypotheses.

#### The Fearless Pathway

Research on psychopathy and aversive startle potentiation has demonstrated clear deficits in relation to F1, indicative of low fear. Personality and clinical data have further shown an association with low anxiety and, to a somewhat lesser degree, strong reward-approach (e.g., social dominance). On the basis of these findings, it seems reasonable to propose that fearlessness is at the heart of this factor, but that for institutionalized psychopaths, a weak BIS is an important contributor—both to the fearless behavior and to more maladaptive unrestrained—impulsive behavior. Until there is supportive evidence, the executive control system is not assumed to be deficient.

If the BIS is normal, and if childhood development has proceeded well, with emergence of good attachments, empathy, and conscience, the fearless temperament would produce a personality with many features of boldness as described by the triarchic model. Such a person could be a model of courageous, socially responsible behavior, with willingness to take risks that require fearlessness. However, even with a relatively benign developmental trajectory, boldness is likely to include some degree of narcissism, thrill seeking, and lack of emotional sensitivity (Skeem et al., 2011, p. 106), with a strong flavoring of self-interested, mildly callous pursuit of rewards. On the other hand, development in such cases could go badly to varying degrees, with a lack of empathy and attachments producing skilled predation-the image of a successful psychopath. In the most negative developmental outcomes, fearless insensitivity shaped in the directions of antagonism and callousness could give rise to high levels of meanness with extreme antisocial predation.

If fearlessness is accompanied by a weak BIS and thus a lack of behavioral restraint, varying degrees of dysfunctional impulsivity would accompany the fearlessness and a negative developmental trajectory is much more likely. Patrick and Bernat (2009, p. 1114) suggested this combination of fearlessness and weak behavioral restraint: "Our theoretical perspective is that the classic syndrome of psychopathy as described by Cleckley reflects the confluence within the same individual of two distinctive etiologic processes—one involving a lack of normal defensive (fear) reactivity that confers an immunity to internalizing problems, and the other a dispositional weakness in impulse control that confers a vulnerability to externalizing problems."

There are several attractive features of positing a variant of psychopathy entailing weak restraint in conjunction with low fear. It would account for some of the maladaptive features that led Cleckley (1941/1976) to view psychopathic individuals as suffering from severe pathology. It also would make the common diagnosis of ADHD in lowfear antisocial children not at all surprising. The combination of fearlessness and deficient restraint would create a major challenge for parenting with a high probability of a trajectory ending with antagonism and callousness (meanness). Deficient restraint in the absence of fear would produce impulsive behavior but without the unregulated negative affect associated with F2, because the affective intensity of reactive fear, anger, and frustration would be greatly reduced. At the same time, the behavioral component of reactive aggression and frustration-related aggression would be strongly evident. Of course, greater deficits in behavioral restraint (associated with a weak BIS) would be associated with more severe problems and a greater probability of especially severe antisocial behavior. At the same time, deficient restraint associated with a weak BIS would not be characterized by the broader range of problems associated with executive control deficits ("unconscientious disinhibition") seen in connection with F2.

## The Factor 2 Externalizing Pathway

The F2 component of adult psychopathy is strongly associated with early-onset disinhibition of behavior and negative affect, with high levels of all aspects of negative affect, including especially disinhibited expressions of anger and frustration. It is isomorphic with a broad externalizing disposition or propensity that includes antisocial behavior, substance abuse and alcoholism, ADHD, low scores on Constraint, and P3 deficits. Externalizing proneness is also associated with an ERN deficit and has been conceptualized as reflecting impairments in executive control.

This characterization of poor emotion regulation in connection with F2, combined with developmental antecedents of ADHD-C comorbid with ODD and CD, connects clearly with the classic developmental literature on difficult temperament. Although difficult temperament could refer to many things, the most popular reference is to unrestrained negative affect. As with a fearless temperament, this form of difficult temperament constitutes a challenge for parenting. With unskilled parenting and a failure of attachment, this temperament disposition tends to elicit coercive parenting that, in turn, disposes toward an antisocial trajectory. Familial support for, or tolerance of, antisocial behavior and deviant peer association promotes criminal activity. The resultant antisocial behavior in such cases is characterized much more by reactive anger and impulsive reward-seeking, and less by cool predation with callousness and lack of empathy, but a hostile–antagonistic interpersonal orientation with lack of concern for others could well arise in this pathway.

#### The ADHD Perspective

The ADHD literature has documented two distinct symptom dimensions: inattention-disorganization and hyperactive-impulsivity. I-D resembles the temperament dimension of low Conscientiousness and is well documented to be associated with nonaffective EF tasks and neuropsychological deficits. Thus, poor executive control is at the heart of this dimension. In addition to hyperactivity and impulsivity, the H-I dimension is associated with high NEM, overt rejection by peers, relational aggression, and more frequent (than I-D) comorbidity with externalizing disorders. It is proposed here that poor executive control also is the primary deficit responsible for the impulsivity seen in H-I when separate H-I and inattention factors are derived. Thus, poor executive control appears to be the major contributor to ADHD and a risk factor for comorbid antisocial behavior. It is possible, however, that a weak BIS (poor motivational inhibition) contributes to this dimension in some cases.

In any event, the I-D and H-I dimensions are highly correlated, and it is their combination in the form of ADHD-C that is associated with high comorbidity with CD and ODD. The disinhibition and poor emotion regulation, when combined with a high NEM temperament, results in disinhibited frustration, irritability, anger, and reactive aggression. This phenotype, when comorbid with CD, appears to be the antecedent of psychopathy F2, in which the most salient features are disinhibition and high negative affect. Complications of a dysfunctional reward-approach system likely also contribute to inept behavior that appears to be impulsive in a reasonably large subgroup, although how this deficit articulates with poor executive control is uncertain.

An important subset of children with ADHD-C + CD is characterized by a low fear/low BIS (often CU) pathway. In this alternative pathway, executive control deficits presumably would not be an important contributor. This F1 pathway in adults is associated with a strong, normally functioning reward-approach system.

#### Callous-Unemotionality (Meanness)

Theories regarding the etiology of callous-unemotionality, or meanness, begin with some version of a difficult temperament. The two common difficult temperaments, fearlessness and disinhibited anger, constitute major challenges that require especially skilled parenting. With such parenting, a positive relationship with, or secure attachment to, parents (especially the mother) fosters the development of empathy and conscience, often even in spite of coercive parenting. A failure of attachment combined with coercive parenting that is elicited by the difficult temperament results in a lack of empathy and conscience. The low-fear temperament is associated with a less emotional adverse trajectory involving cool predation and hostility, whereas the high-negative-affect temperament is associated with more conflicted (guilty/distressed) antisocial behavior. Nevertheless, it may be that the angry hostility of this second pathway could produce callous behavior. It was suggested that a temperament dimension of low affiliation could exacerbate the development of callousness and lack of empathy, producing unusually severe meanness.

#### Implications of a Continuous, Multidimensional Approach

Finally, one must assume that all of the systems being discussed are continuously variable. Consequently, they affect observed phenotypes in various ways, and the picture is blurred by variations in reactivity of both the primary systems and others that modify phenotypic expressions. For example, the executive control system has been discussed as related to the F2 pathway, which seems to be the case. There is little in the developmental literature to suggest that poor executive control, on average, is associated with the low-fear pathway. Nevertheless, that finding does not preclude the possibility that variations in the low executive control range cannot in some cases be associated with fearlessness and a weak BIS-with a subsequent exacerbation of impulsive behavior and greater ineptness in those cases. It has already been suggested that variations in BIS reactivity might color the phenotypic picture of the ADHD-C and F2 pathway predominantly associated with an executive control deficit. Similarly, variations in fear, anxiety, and reward-approach will affect the manifestations of both pathways, as will variations in affiliation. It was also suggested that a strong reward-approach system may combine with poor executive control to produce a risk of impulsive antisocial behavior, including addictive problems, as in the F2 pathway-albeit with higher positive affectivity. Possibly this type of impulsivity will blend into the F1 pathway if accompanied by low fear/anxiety and into the F2 pathway if accompanied by high fear/ anxiety. This considerable blurring of phenotypes is to be expected from continuously distributed temperament dimensions and is consistent with the complexity and diversity of human behavior.

If valid, this model has implications for our use of the term "psychopathy." The complex, multifactorial pathways to various forms of antisocial behavior constitute the external reality. There is not a psychopathy taxon to be discovered. Rather, it is a construct we apply to certain clinical expressions of unrestrained behavioral deviancy. The construct was created to account for forms of impulsive-antisocial behavior whose etiology reflects some biobehavioral deficit or extreme variant of temperament-as opposed to antisocial behavior or criminality that is simply the product of social learning (e.g., subcultural delinquency). The existing empirical literature supports at least two major pathways (F1 and F2), reflecting a number of deficits or temperament variations (low fear, weak BIS, poor executive control, dysfunctional DA-based reward-approach, high NEM, low affiliation, etc.) that justify application of the term "psychopathy" in some way. Two obvious options for coping with this diversity are to (1) adopt the theoretical position (following Cleckley [1941/1976] and Karpman [1941]) that the F1 pathway represents true or primary psychopathy, whereas the F2 pathway represents secondary psychopathy, or (2) embrace both pathways (following practice with the PCL-R) as legitimate forms of psychopathy. Given the severity of the deficits associated with F2, there is much to be said for including this expression as "true" psychopathy. Of course, given the continuous, multidimensional nature of etiology, there always will be much blurring of boundaries in any attempt to characterize psychopathy or to delineate subtypes of psychopathy.

#### REFERENCES

- Allis, C. D., Jenuwein, T., & Reinberg, D. (2007). *Epigenetics*. Cold Spring Harbor, NY: Cold Spring Harbor Laboratory Press.
- American Psychiatric Association. (2000). Diagnostic and statistical manual of mental disorders (4th ed., text rev.). Washington, DC: Author.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: Author.
- Barkley, R. A. (1997). Behavioral inhibition, sustained attention, and executive functions: Constructing a unifying theory of ADHD. *Psychological Bulletin*, 121, 65–94.
- Barkley, R. A. (2003). Attention-deficit/hyperactivity disorder. In E. J. Mash & R. A. Barkley (Eds.), Child psychopathology (2nd ed., pp. 75–143). New York: Guilford Press.
- Barlow, D. H. (1988). Anxiety and its disorders. New York: Guilford Press.
- Barlow, D. H. (2000). Unraveling the mysteries of anxiety and its disorders from the perspective of emotion theory. *American Psychologist*, *55*, 1247–1263.
- Barlow, D. H. (2002). Anxiety and its disorders: The nature and treatment of anxiety and panic (2nd ed.). New York: Guilford Press.
- Beauchaine, T. P. (2001). Vagal tone, development, and Gray's motivational theory: Toward an integrated model of autonomic nervous system functioning in psychopathology. *Development and Psychopathology*, 13, 183–214.
- Beauchaine, T. P., & McNulty, T. (2013). Comorbidities and continuities as ontogenic processes: Toward a developmental spectrum model of externalizing psychopathology. *Development and Psychopathology*, 25, 1505–1528.
- Benning, S. D., Patrick, C. J., Blonigen, D. M., Hicks, B. M., & Iacono, W. G. (2005). Estimating facets of psychopathy from normal personality traits: A step toward community-epidemiological investigations. Assessment, 12, 3–18.
- Benning, S. D., Patrick, C. J., Hicks, B. M., Blonigen, D. M., & Krueger, R. F. (2003). Factor structure of the Psychopathic Personality Inventory: Validity and implications for clinical assessment. *Psychological As*sessment, 15, 340–350.
- Benning, S. D., Patrick, C. J., Salekin, R. T., & Leistico, A. R. (2005). Convergent and discriminant validity of psychopathy factors assessed via self-report: A comparison of three instruments. Assessment, 12, 270–289.
- Blair, R. J. R. (1995). A cognitive developmental approach to morality: Investigating the psychopath. *Cognition*, 57, 1–29.
- Blair, R. J. R., Colledge, E., Murray, L., & Mitchell, D. G. (2001). A selective impairment in the processing of sad and fearful expressions in children with

psychopathic tendencies. Journal of Abnormal Child Psychology, 29(6), 491–498.

- Blonigen, D., Hicks, B., Patrick, C., Krueger, R., Iacono, W., & McGue, M. (2005). Psychopathic personality traits: Heritability and genetic overlap with internalizing and externalizing pathology. *Psychological Medicine*, 35, 637–648.
- Bradley, M., Cuthbert, B. N., & Lang, P. J. (1999). Affect and the startle reflex. In M. E. Dawson, A. M. Schell, & A. H. Bohmelt (Eds.), Startle modification: Implications for neuroscience, cognitive science, and clinical science (pp. 157–183). Boston: Cambridge University Press.
- Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait–multimethod matrix. *Psychological Bulletin*, 56, 81–105.
- Carey, N. (2012). The epigenetics revolution: How modern biology is rewriting our understanding of genetics, disease, and inheritance. New York: Columbia University Press.
- Cicchetti, D. (2013). Developmental psychopathology. In P. Zelazo (Ed.), Oxford handbook of developmental psychology (Vol. 2, pp. 455–480). New York: Oxford University Press.
- Clark, L. A., & Watson, D. (1999). Temperament: A new paradigm for trait psychology. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality* (2nd. ed., pp. 399–423). New York: Guilford Press.
- Cleckley, H. (1976). *The mask of sanity* (5th ed.). St. Louis, MO: Mosby. (Original work published 1941)
- Cloninger, C. R. (1987). The Tridimensional Personality Questionnaire: Version 4. St. Louis, MO: Department of Psychiatry, Washington University School of Medicine.
- Cornell, A. H., & Frick, P. J. (2007). The moderating effects of parenting styles in the association between behavioral inhibition and parent-reported guilt and empathy in preschool children. *Journal of Clinical Child and Adolescent Psychology*, 36, 305–318.
- Corr, P. J., & McNaughton, N. (2015). Neural mechanisms of low trait anxiety and risk for externalizing behavior. In T. P. Beauchaine & S. P. Hinshaw (Eds.), Oxford handbook of externalizing spectrum disorders: A developmental psychopathology perspective (pp. 220–238). Oxford, UK: Oxford University Press.
- Costa, P. T., & McCrae, R. R. (1992). Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) professional manual. Odessa, FL: Psychological Assessment Resources.
- Dadds, M. R., Moul, C., Cauchi, A., Dobson-Stone, C., Hawes, D. J., Brennan, J., et al. (2014). Polymorphisms in the oxytocin receptor gene are associated with the development of psychopathy. *Development* and Psychopathology, 26, 21–31.
- Damasio, A. R. (1994). Descartes' error. New York: Putman's Sons.
- Davis, M., Walker, D. L., Miles, L., & Grillon, C. (2009). Phasic vs sustained fear in rats and humans: Role of

the extended amygdala in fear vs anxiety. *Neuropsy-chopharmacology*, 35, 105–135.

- Depue, R. A., & Collins, P. F. (1999). Neurobiology of the structure of personality: Dopamine, facilitation of incentive motivation, and extraversion. *Behavioral* and Brain Sciences, 22, 491–517.
- Depue, R. A., & Iacono, W. G. (1989). Neurobehavioral aspects of affective disorders. Annual Review of Psychology, 40, 457–492.
- Depue, R. A., & Lenzenweger, M. F. (2001). A neurobehavioral dimensional model. In W. J. Livesley (Ed.), Handbook of personality disorders: Theory, research, and treatment (pp. 136–176). New York: Guilford Press.
- Depue, R. A., & Morrone-Strupinsky, J. V. (2005). A neurobehavioral model of affiliative bonding: Implications for conceptualizing a human trait of affiliation. Behavioral and Brain Sciences, 28, 313–349.
- DeYoung, C. G., Quilty, L. C., & Peterson, J. B. (2007). Between facets and domains: 10 aspects of the Big Five. Journal of Personality and Social Psychology, 93, 880–896.
- Douglas, V. I. (1988). Cognitive deficits in children with attention deficit disorder with hyperactivity. In L. M. Bloomingdale & J. Sargeant (Eds.), Attention deficit disorder: Criteria, cognition, intervention (pp. 65–81). Oxford, UK: Pergamon Press.
- Douglas, V. (1999). Cognitive control processes in attention deficit/hyperactivity disorder. In H. C. Quay & A. E. Hogan (Eds.), Handbook of disruptive behavior disorders (pp. 105–138). New York: Kluwer/Plenum Press.
- Eisenberg, N., & Morris, A. S. (2002). Children's emotion-related regulation. In R. Kail (Ed.), Advances in child development and behavior (Vol. 30, pp. 190–229). Amsterdam: Academic Press.
- Eisenberg, N., Spinrad, T. L., & Eggum, N. D. (2010). Emotion-related self-regulation and its relation to children's maladjustment. *Annual Review of Clinical Psychology*, 6, 495–525.
- Eisenberg, N., Zhou, Q., Losoya, S. H., Fabes, R. A., Shepard, S. A., Murphy, B. C., et al. (2003). The relations of parenting, effortful control, and ego control to children's emotional expressivity. *Child Development*, 74, 875–895.
- Fowles, D. C. (1980). The three arousal model: Implications of Gray's two-factor learning theory for heart rate, electrodermal activity, and psychopathy. *Psychophysiology*, 17, 87–104.
- Fowles, D. C. (1987). Application of a behavioral theory of motivation to the concepts of anxiety and impulsivity. *Journal of Research in Personality*, 21, 417–435.
- Fowles, D. C. (2006). Jeffrey Gray's contributions to theories of anxiety, personality, and psychopathology. In T. Canli (Ed.), *Biological basis of personality* and individual differences (pp. 7–34). New York: Guilford Press.
- Fowles, D. C., & Dindo, L. (2006). A dual deficit model

of psychopathy. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 14–34). New York: Guilford Press.

- Francis, R. C. (2011). Epigenetics; How environment shapes our genes. New York: Norton.
- Frick, P. J., Blair, R. J., & Castellanos, F. X. (2013). Callous–unemotional traits and developmental pathways to the disruptive behavior disorders. In P. H. Tolan & B. L. Leventhal (Eds.), Advances in development and psychopathology: Brain Research Foundation Symposium Series: Vol. 1. Disruptive behavior disorders (pp. 69–102). New York: Springer Science+Business Media.
- Frick, P. J., & Morris, A. S. (2004). Temperament and developmental pathways to conduct problems. *Journal of Clinical Child and Adolescent Psychology*, 33, 54–68.
- Frick, P. J., & Nigg, J. T. (2012). Current issues in the diagnosis of attention deficit hyperactivity disorder, oppositional defiant disorder, and conduct disorder. *Annual Review of Clinical Psychology*, 8, 77–107.
- Frick, P. J., & Viding, E. M. (2009). Antisocial behavior from a developmental psychopathology perspective. *Development and Psychopathology*, 21, 1111–1131.
- Frick, P. J., & White, S. F. (2008). Research review: The importance of callous–unemotional traits for developmental models of aggressive and antisocial behavior. *Journal of Child Psychology and Psychiatry*, 49, 359–375.
- Gray, J. A. (1977). Drug effects on fear and frustration: Possible limbic site of action of minor tranquilizers. In L. L. Iversen, S. D. Iversen, & S. H. Snyder (Eds.), Handbook of psychopharmacology: Vol. 8. Drugs, neurotransmitters, and behavior (pp. 433–529). New York: Plenum Press.
- Gray, J. A. (1978). The neuropsychology of anxiety. British Journal of Psychology, 69, 417–434.
- Gray, J. A. (1979). A neuropsychological theory of anxiety. In C. E. Izard (Ed.), *Emotions in personality and psychopathology* (pp. 303–335). New York: Plenum Press.
- Gray, J. A. (1982). The neuropsychology of anxiety: An enquiry into the functions of the septo-hippocampal system. Oxford: Oxford University Press.
- Gray, J. A. (1987). The psychology of fear and stress (2nd ed.). Cambridge, UK: Cambridge University Press.
- Gray, J. A., & McNaughton, N. (2000). The neuropsychology of anxiety: An enquiry into the functions of the septo-hippocampal system (2nd ed). Oxford. UK: Oxford University Press.
- Gross, J. J., & Thompson, R. A. (2007). Emotion regulation: Conceptual foundations. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 3–24). New York: Guilford Press.
- Hall, J. R., Bernat, E. M., & Patrick, C. J. (2007). Externalizing psychopathology and the error-related negativity. *Psychological Science*, 18, 326–333.
- Hare, R. D. (1991). Manual for the Revised Psychopathy Checklist. Toronto: Multi-Health Systems.
- Hare, R. D. (2003). The Hare Psychopathy Checklist— Revised, 2nd Edition. Toronto: Multi-Health Systems.

- Harpur, T. J., Hare, R. D., & Hakstian, A. R. (1989). Two-factor conceptualization of psychopathy: Construct validity and assessment implications. *Psychological Assessment*, 1, 6–17.
- Hicks, B. M., Bernat, E., Malone, S. M., Iacono, W. G., Patrick, C. J., Krueger, R. F., et al. (2007). Genes mediate the association between P3 amplitude and externalizing disorders. *Psychophysiology*, 44, 98–105.
- Hicks, B. M., Markon, K. E., Patrick, C. J., Krueger, R. F., & Newman, J. P. (2004). Identifying psychopathy subtypes on the basis of personality structure. *Psychological Assessment*, 16, 276–288.
- Iacono, W. G., Carlson, S. R., Malone, S. M., & McGue, M. (2002). P3 event-related potential amplitude and the risk for disinhibitory disorders in adolescent boys. *Archives of General Psychiatry*, 59, 750–757.
- Kahneman, D. (2011). *Thinking, fast and slow*. New York: Farrar, Straus & Giroux.
- Karalunas, S. L., Fair, D., Musser, E. D., Aykes, K., Iyer, S. P., & Nigg, J. T. (2014). Subtyping attention-deficit/hyperactivity disorder using temperament dimensions: Toward biologically based nosologic criteria. JAMA Psychiatry, 71, 1015–1024.
- Karpman, B. (1941). On the need for separating psychopathy into two distinct clinical types: Symptomatic and idiopathic. *Journal of Criminology and Psychopathology*, 3, 112–137.
- Kochanska, G. (1993). Toward a synthesis of parental socialization and child temperament in early development of conscience. *Child Development*, 64, 325– 347.
- Kochanska, G. (1995). Children's temperament, mothers' discipline, and security of attachment: Multiple pathways to emerging internalization. *Child Development*, 66, 597–615.
- Kochanska, G. (1997). Multiple pathways to conscience for children with different temperaments: From toddlerhood to age 5. Developmental Psychology, 33, 228–240.
- Kochanska, G. (2002). Mutually responsive orientation between mothers and their young children: A context for the early development of conscience. Current Directions in Psychological Science, 11, 191–195.
- Kochanska, G., Aksan, N., & Joy, M. E. (2007). Children's fearfulness as a moderator of parenting in early socialization: Two longitudinal studies. *Developmental Psychology*, 43, 222–237.
- Kochanska, G., & Kim, S. (2012). Toward a new understanding of legacy of early attachments for future antisocial trajectories: Evidence from two longitudinal studies. *Development and Psychopathology*, 24, 783–806.
- Kramer, M. D., Patrick, C. J., Krueger, R. F., & Gasperi, M. (2012). Delineating physiological defensive reactivity in the domain of self-report: Phenotypic and etiologic structure of dispositional fear. *Psychological Medicine*, 42, 1305–1320.
- Krueger, R. F. (1999). The structure of common mental disorders. Archives of General Psychiatry, 56, 921–926.

- Krueger, R. F., Hicks, B. M., Patrick, C. J., Carlson, S. R., Iacono, W. G., & McGue, M. (2002). Etiologic connections among substance dependence, antisocial behavior and personality: Modeling the externalizing spectrum. *Journal of Abnormal Psychology*, 111, 411–424.
- Krueger, R. F., & Markon, K. E. (2006). Reinterpreting comorbidity: A model-based approach to understanding and classifying psychopathology. *Annual Review of Clinical Psychology*, 2, 111–133.
- Krueger, R. F., Markon, K. E., Patrick, C. J., Benning, S. D., & Kramer, M. D. (2007). Linking antisocial behavior, substance use, and personality: An integrative quantitative model of the adult externalizing spectrum. *Journal of Abnormal Psychology*, 116, 645–666.
- Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (1990). Emotion, attention and the startle reflex. *Psychological Review*, 97, 377–395.
- Leshner, A. I. (1997). Addiction is a brain disease, and it matters. Science, 278, 45–47.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment*, 66, 488–524.
- Lilienfeld, S. O., & Fowler, K. (2006). The self-report assessment of psychopathy: Problems, pitfalls, and promises. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 107–132). New York: Guilford Press.
- Lykken, D. T. (1957). A study of anxiety in the sociopathic personality. *Journal of Abnormal and Social Psychology*, 55, 6–10.
- Lykken, D. T. (1995). The antisocial personalities. Mahwah, NJ: Erlbaum.
- Lynam, D. R. (1996). The early identification of chronic offenders: Who is the fledgling psychopath? *Psychological Bulletin*, 120, 209–234.
- Markon, K. E., Krueger, R. F., & Watson, D. (2005). Delineating the structure of normal and abnormal personality: An integrative hierarchical approach. *Journal of Personality and Social Psychology*, 88, 139–157.
- Martel, M. M., Nigg, J. T., & von Eye, A. (2009). How do trait dimensions map onto ADHD symptom domains? Journal of Abnormal Child Psychology, 37, 337–348.
- McCord, W., & McCord, J. (1964). The psychopath: An essay on the criminal mind. Princeton, NJ: Van Nostrand.
- Metcalfe, J., & Mischel, W. (1999). A hot/cool-system analysis of delay of gratification: Dynamics of willpower. Psychological Review, 106, 3–19.
- Mischel, W., & Ayduk, O. (2004). Willpower in a cognitive–affective processing system: The dynamics of delay of gratification. In R. F. Baumeister & K. D. Vohs (Eds.), Handbook of self-regulation: Research, theory and applications (pp. 99–129). New York: Guilford Press.
- Mischel, W., & Ayduk, O. (2010). Willpower in a cog-

nitive-affective processing system: The dynamics of delay of gratification. In K. D. Vohs & R. F. Baumeister (Eds.), *Handbook of self-regulation: Research, theory and applications* (2nd ed., pp. 83–105). New York: Guilford Press.

- Moffitt, T. E. (1993). Adolescence-limited and lifecourse persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, 700, 674–701.
- Moffitt, T. E. (2003). Life-course persistent and adolescence-limited antisocial behavior: A 10-year research review and research agenda. In B. B. Lahey, T. E. Moffitt, & A. Caspi (Eds.), Causes of conduct disorder and juvenile delinquency (pp. 49–75). New York: Guilford Press.
- Musser, E. D., Galloway-Long, H. S., Frick, P. J., & Nigg, J. T. (2013). Emotion regulation and heterogeneity in attention-deficit/hyperactivity disorder. *Journal of the American Academy of Child and Adolescent Psychia*try, 52, 163–171.
- Neuhaus, E., & Beauchaine, T. P. (2013). Impulsivity and vulnerability to psychopathology. In T. P. Beauchaine & S. V. Hinshaw (Eds.), *Child and adolescent psychopathology* (2nd ed., pp. 197–226). Hoboken, NJ: Wiley.
- Nigg, J. T. (2000). On inhibition/disinhibition in developmental psychopathology: Views from cognitive and personality and a working inhibition taxonomy. *Psychological Bulletin*, 126, 220–246.
- Nigg, J. T. (2001). Is ADHD a disinhibitory disorder? Psychological Bulletin, 127, 571–598.
- Nigg, J. T. (2005). Neuropsychological theory and findings in ADHD: The state of the field and salient challenges for the coming decade. *Biological Psychiatry*, 57, 1424–1435.
- Nigg, J. T. (2006a). Temperament and developmental psychopathology. *Journal of Child Psychology and Psychiatry*, 47, 395–422.
- Nigg, J. T. (2006b). What causes ADHD?: Understanding what goes wrong and why. New York: Guilford Press.
- Nigg, J. T. (2010). Attention-deficit/hyperactivity disorder: Endophenotypes, structure, and etiological pathways. Current Directions in Psychological Science, 19, 24–29.
- Nigg, J. T. (2012). Future directions in ADHD etiology research. Journal of Clinical Child and Adolescent Psychology, 41, 524–533.
- Nigg, J. T. (2013). Attention deficit/hyperactivity disorder. In T. P. Beauchaine & S. V. Hinshaw (Eds.), *Child and adolescent psychopathology* (2nd ed., pp. 377–409). Hoboken, NJ: Wiley.
- Nigg, J. T., & Casey, B. J. (2005). An integrative theory of attention-deficit/hyperactivity disorder based on the cognitive and affective neurosciences. *Development and Psychopathology*, 17, 785–806.
- Nigg, J. T., Goldsmith, H. H., & Sachek, J. (2004). Temperament and attention-deficit/hyperactivity disorder: The development of a multiple pathway model. *Journal of Clinical Child and Adolescent Psychology*, 33, 42–53.

- Nigg, J. T., Willcutt, E., Doyle, A. E., & Sonuga-Barke, J. S. (2005). Causal heterogeneity in ADHD: Do we need neuropsychologically impaired subtypes? *Biological Psychiatry*, 57, 1224–1230.
- Pardini, D. A. (2006). The callousness pathway to severe violent delinquency. Aggressive Behavior, 32, 590–598.
- Patrick, C. J. (2010). Conceptualizing psychopathic personality: Disinhibited, bold, or just plain mean? In R. J. Salekin & D. R. Lynam (Eds.), Handbook of child and adolescent psychopathy (pp. 15–48). New York: Guilford Press.
- Patrick, C. J., & Bernat, E. M. (2009). Neurobiology of psychopathy: A two-process theory. In G. Berntson & J. T. Cacioppo (Eds.), *Handbook of neuroscience for the behavioral sciences* (pp. 1110–1131). Hoboken, NJ: Wiley.
- Patrick, C. J., Bernat, E., Malone, S. M., Iacono, W. G., Krueger, R. F., & McGue, M. K. (2006). P300 amplitude as an indicator of externalizing in adolescent males. *Psychophysiology*, 43, 84–92.
- Patrick, C. J., Bradley, M. M., & Lang, P. J. (1993). Emotion in the criminal psychopath: Startle reflex modulation. *Journal of Abnormal Psychology*, 102, 82–92.
- Patrick, C. J., Cuthbert, B. N., & Lang, P. J. (1994). Emotion in the criminal psychopath: Fear image processing. *Journal of Abnormal Psychology*, 103, 523–534.
- Patrick, C. J., & Drislane, L. E. (2015). Triarchic model of psychopathy: Origins, operationalizations, and observed linkages with personality and general psychopathology. *Journal of Personality*, 83, 627–643.
- Patrick, C. J., Durbin, C. E., & Moser, J. S. (2012). Conceptualizing proneness to antisocial deviance in neurobehavioral terms. *Development and Psychopathol*ogy, 24, 1047–1071.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. Development and Psychopathology, 21, 913–938.
- Patrick, C. J., Hicks, B. M., Krueger, R. F., & Lang, A. R. (2005). Relations between psychopathy facets and externalizing in a criminal offender sample. *Journal* of Personality Disorders, 19, 339–356.
- Patrick, C. J., Kramer, M. D., Krueger, R. F., & Markon, K. E. (2013). Optimizing efficiency of psychopathology assessment through quantitative modeling: Development of a brief form of the Externalizing Spectrum Inventory. *Psychological Assessment*, 25, 1332–1348.
- Patrick, C. J., & Lang, A. R. (1999). Psychopathic traits and intoxicated states: Affective concomitants and conceptual links. In M. E. Dawson, A. M. Schell, & A. H. Boehmelt (Eds.), Startle modification: Implications for clinical science, cognitive science, and neuroscience (pp. 209–230). New York: Cambridge University Press.
- Patterson, G. R., DeGarmo, D. S., & Knutson, N. (2000). Hyperactive and antisocial behaviors: Comorbid or two points in the same process. *Development and Psychopathology*, 12, 91–106.

- Patterson, G. R., Reid, J. B., & Dishion, T. J. (1992). Antisocial boys. Eugene, OR: Castalia.
- Plichta, M. M., & Scheres, A. (2014). Ventral-striatal responsiveness during reward anticipation in ADHD and its relation to trait impulsivity in the healthy population: A meta-analytic review of the fMRI literature. *Neuroscience and Biobehavioral Review*, 38, 125–134.
- Poythress, N. G., Lillienfeld, S. O., Skeem, J. L., Douglas, K. S., Edens, J. F., Epstein, M., et al. (2010). Using the PCL-R to help estimate the validity of two selfreport measures of psychopathy with offenders. Assessment, 17, 206–219.
- Purcell, S., & Sham, P. (2002). Variance components models for gene–environment interaction in quantitative trait locus linkage analysis. *Twin Research*, 5, 572–576.
- Robinson, T. E., & Berridge, K. C. (2003). Addiction. Annual Review of Psychology, 54, 25–53.
- Rothbart, M. K., & Ahadi, S. A. (1994). Temperament and the development of personality. *Journal of Ab*normal Psychology, 103, 55–66.
- Rothbart, M. K., Ahadi, S. A., Hershey, K. L., & Fisher, P. (2001). Investigations of temperament at three to seven years: The Children's Behavior Questionnaire. *Child Development*, 72, 1394–1408.
- Rothbart, M. K., & Bates, J. E. (1998). Temperament. In W. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), Handbook of child psychology: Vol. 3. Social emotional and personality development (5th ed., pp. 105–176). New York: Wiley.
- Rutter, M. (2006). Genes and behavior: Nature–nurture interplay explained. Malden, MA: Blackwell.
- Sikström, S., & Söderlund, G. (2007). Stimulus-dependent dopamine release in attention-deficit/hyperactivity disorder. Psychological Review, 114, 1047–1075.
- Skeem, J., Johansson, P., Andershed, H., Kerr, M., & Louden, J. E. (2007). Two subtypes of psychopathic violent offenders that parallel primary and secondary variants. *Journal of Abnormal Psychology*, 116, 395–409.
- Skeem, J. L., Polaschek, D. L. L., Patrick, C. J., & Lilienfeld, S. O. (2011). Psychopathic personality: Bridging the gap between scientific evidence and public policy. Psychological Science in the Public Interest, 12, 95–162.
- Spielberger, C. D. (1996). State–Trait Anger Expression Inventory: Professional manual. Odessa, FL: Psychological Assessment Resources.
- Spielberger, C. D., Jacobs, G., Russell, S., & Crane, R. S. (1983). Assessment of anger: The State–Trait Anger Scale. In J. N. Butcher & C. D. Spielberger (Eds.), Advances in personality assessment (pp. 159–187). Hillsdale, NJ: Erlbaum.
- Sutton, S. K., Vitale, J. E., & Newman, J. P. (2002). Emotion among women with psychopathy during picture perception. *Journal of Abnormal Psychology*, 111, 610–619.
- Sylvers, P., Lilienfeld, S. O., & LaPrairie, J. L. (2011).

Differences between trait fear and trait anxiety: Implications for psychopathology. *Clinical Psychology Review*, 31, 122–137.

- Tellegen, A. (1982). Manual for the Multidimensional Personality Questionnaire. Unpublished manuscript, University of Minnesota, Minneapolis, MN.
- Tuvblad, C., Zheng, M., Raine, A., & Baker, L. A. (2009). A common genetic factor explains the covariation among ADHD ODD and CD symptoms in 9–10 year old boys and girls. *Journal of Abnormal Child Psychology*, 37, 153–167.
- Vaidyanathan, U., Patrick, C. J., & Bernat, E. M. (2009). Startle reflex potentiation during aversive picture viewing as an index of trait fear. *Psychophysiology*, 46, 75–85.
- Valiente, C., Eisenberg, N., Smith, C. L., Reiser, M., Fabes, R. A., Losoya, S., et al. (2003). The relations of effortful control and reactive control to children's externalizing problems: A longitudinal assessment. *Journal of Personality*, 71, 1179–1205.
- Verona, E., Bresin, K., & Patrick, C. J. (2013). Revisiting psychopathy in women: Cleckley/Hare conceptions and affective response. *Journal of Abnormal Psychol*ogy, 122, 1088–1093.
- Willcutt, E. G., Doyle, A. E., Nigg, J. T., Faraone, S. V.,

& Pennington, B. F. (2005). Validity of the executive function theory of ADHD: Meta-analytic review. *Biological Psychiatry*, *57*, 1336–1346.

- Willcutt, E. G., Nigg, J. T., Pennington, B. F., Solanto, M. V., Rohde, L. A., Tannock, R., et al. (2012). Validity of DSM-IV attention deficit/hyperactivity disorder symptom dimensions and subtypes. *Journal of Abnormal Psychology*, 121, 991–1010.
- Wise, R. A., & Bozarth, M. A. (1987). A psychomotor stimulant theory of addiction. *Psychological Review*, 94, 469–492.
- Yancey, J. R., Venables, N. C., Hicks, B. M., & Patrick, C. J. (2013). Evidence for a heritable basis to deviance-promoting deficits in self-control. *Journal of Criminal Justice*, 41, 309–317.
- Young, S. E., Friedman, N. P., Miyake, A., Willcutt, E. G., Corley, R. P., Haberstick, B. C., et al. (2009). Behavioral disinhibition: Liability for externalizing spectrum disorders and its genetic and environmental relation to response inhibition across adolescence. *Journal of Abnormal Psychology*, 118, 117–130.
- Young, S. E., Stallings, M. C., Corley, R. P., Krauter, K. S., & Hewitt, J. K. (2000). Genetic and environmental influences on behavioral disinhibition. *American Journal of Medical Genetics*, 96, 684–695.
# PART II

# DISTINCT PHENOTYPIC FACETS OF PSYCHOPATHY

# CHAPTER 6

# Externalizing Proneness and Psychopathy

LINDSAY D. NELSON JENS FOELL

A pervasive lack of behavioral restraint is central to all historic and contemporary conceptions of psychopathy, as exemplified by the following passages from Cleckley's (1941/1976) classic text, *The Mask of Sanity*:

The psychopath, however perfectly he mimics man theoretically . . . fails altogether when he is put into the practice of actual living. (p. 370)

The psychopath requires impulses of scarcely more than whimlike intensity to bring about unacceptable behavior... Even the faintest or most fleeting notion or inclination ... is by no means unlikely to emerge as the deed. The sort of repugnance or other inhibiting force that would prevent any or all such impulses from being followed (or perhaps from even becoming conscious impulses) in another person is not a factor that can be counted on to play much part in the psychopath's decisions. (p. 360)

The construct of externalizing proneness, which encompasses tendencies toward impulse control problems of various types, along with affiliated traits, emerged out of research on both child and adult psychopathology and has gained increased visibility in recent years. Multiple lines of evidence—including behavior-genetic, developmental, and neuroscientific—support the construct's conceptual and etiological coherence and have documented its role in multiple forms of psychopathology and other health-related outcomes. Externalizing proneness closely parallels the disinhibitory-behavioral (Factor 2) features of psychopathy as assessed by different instruments, which in turn relate to substance use problems. As externalizing proneness predominantly reflects behavioral disinhibition, it is distinguishable from the affective-interpersonal (Factor 1) features of psychopathy that are seen to reflect callous-unemotional and fearless-dominant (bold) trait tendencies (Venables, Hall, & Patrick, 2014). Given the coverage provided by other chapters of this handbook on constructs related to Factor 1 and psychopathy's interface with substance-related problems, this chapter focuses primarily on disinhibition (i.e., externalizing proneness) as a facet of psychopathy, with these other topics considered as needed to address how the construct of externalizing proneness intersects and diverges from that of psychopathy.

The chapter begins with an overview of historical findings from personality, child temperament, neuropsychological, and other research areas that served as foundations for formulation of the externalizing construct, and describes how structural modeling and behavior genetics work has contributed to operationalization and further refinement of the construct. We then summarize evidence for the empirical correlates of externalizing proneness (alternatively termed "trait disinhibition") across behavioral, personality, psychopathological, health, and neuroscientific outcomes. Finally, we describe a proposed multimethod, construct-network approach to the study of externalizing proneness that, by extension, may facilitate research into the behavioral, psychological, and neurobiological underpinnings of psychopathy.

## Historic Foundations of the Externalizing Proneness Construct

The concept of general externalizing proneness arose from attempts to overcome limitations with traditional classification systems for child and adult mental disorders. In the youth psychopathology literature, the first formal attempts to classify childhood mental disorders appeared in the second edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-II; American Psychiatric Association [APA], 1968), with the specified disorders reflecting broad descriptions of various types of maladaptive behavior (e.g., unsocialized aggressive, group delinquent, hyperkinetic, overanxious, and withdrawing). As was characteristic of early DSM editions, these categories were not delineated in formal, criterion-based terms, resulting in poor agreement among clinicians regarding the classification of individual patients, even for the broadest available diagnostic labels (Freeman, 1971; Sandifer, Pettus, & Quade, 1964).

Capitalizing on the nascent state of the child psychiatric literature at the time, Thomas Achenbach and his colleagues took the novel approach of formulating a classification scheme for conditions of these types through empirical means rather than relying on the theoretical or clinical consensus-based approaches that had dominated the adult psychopathology literature. Specifically, using factor analysis to formally model the covariance among symptoms commonly observed in children, Achenbach (1966) delineated two broad factors, labeled externalizing and internalizing, which he conceptualized as reflecting general tendencies toward conflict with the external world versus problems within oneself, respectively (see also Achenbach, 1974). These broad factors conformed closely to dimensions of psychopathology identified by other authors using similar analytic approaches (e.g., Quay, 1964; Quay & Quay, 1965; Quay, Sprague, & Shulman, 1966). Conveniently, the empirically derived constructs these investigators identified also mapped well onto broad categories of child psychiatric conditions ("syndromes") deduced from a review of research on mental health worker, parent, and teacher reports of child mental health problems. In particular, these review efforts revealed parallel categories labeled "undercontrolled" (encompassing conditions marked by aggression and other "acting-out" [conduct problem] tendencies) and "overcontrolled" (consisting of conditions involving inhibited, socially withdrawn, anxious, and depressive behaviors and symptoms; Achenbach & Edelbrock, 1978).

Among the conceptual contributions made by this early work was the recognition that psychiatric or behavioral problems previously considered to be distinct might actually share common correlates and/or etiologies. Consistent with this, other researchers had proposed that several traditionally separate diagnostic conditions now considered elements of the externalizing spectrum (including antisocial and impulsive personality, alcoholism, hyperactivity, and perhaps psychopathy) appeared to share a common propensity toward disinhibition (Gorenstein & Newman, 1980). Indeed, as discussed more fully below, evidence accrued subsequently to indicate that problems of these types are associated with common neuropsychological and psychophysiological correlates (Iacono, Carlson, Malone, & McGue, 2002; Iacono, Carlson, Taylor, Elkins, & McGue, 1999; Morgan & Lilienfeld, 2000). Additionally, early investigations of gender differences in the prevalence of externalizing versus internalizing psychopathology (Eme; 1979; Schultz, Salvia, & Feinn, 1973), as well as differential patterns of symptomatology in parents of children with externalizing versus internalizing problems (Anderson, 1969), lent credence to the notion that these two broad dimensions might be etiologically distinct, in turn providing the foundation for later work demonstrating a common genetic predisposition for various conditions within the externalizing spectrum (see also Achenbach, 1974).

The concept of an externalizing spectrum of problems emerged more recently as a focus of interest in the adult personality and psychopathology literatures. Mirroring scholarly discussions within the pediatric literature, traditional diagnostic systems for classifying adult psychiatric disorders were increasingly viewed as problematic in the latter part of the 20th century. A major impetus for this realization lay in unanticipated consequences of the criterion-based definitions for psychiatric disorders put forth in DSM-III and DSM-III-R; APA, 1980, 1987) to address the problem of weak reliability of diagnoses in earlier editions. A particular concern was the salient phenomenon of diagnostic comorbidity: Individuals meeting diagnostic criteria for one disorder frequently met criteria for other disorders as well. Given high observed rates of co-occurrence among diagnostic conditions presumed to be distinct from one another, concerns arose about the convention of studying samples limited to "pure" cases (i.e., individuals with single diagnostic conditions unaccompanied by other conditions)—in particular, the failure of this approach to represent the typical configuration and range of severity of psychopathology present in the general population. Moreover, the fact that there appeared to be systematic patterns of comorbidity for certain sets of disorders (e.g., those involving substance abuse, developmental attention/hyperactivity symptoms, and antisocial behavior) implied that these disorders might share a common etiological underpinning that, if identified, could provide a more fundamental, meaningful target for diagnosis and treatment of psychiatric problems than traditional DSM diagnoses (Krueger, 1999b; Krueger, Caspi, Moffitt, & Silva, 1998).

Following from these observations, quantitative-structural analyses were undertaken to characterize patterns of disorder co-occurrence in a systematic manner. Studies of this type revealed broad factors accounting for systematic overlap among adult disorders similar to those identified in pediatric populations. In particular, evidence was found for an externalizing factor reflecting covariance among alcohol dependence, drug dependence, and antisocial personality disorder, and an internalizing factor accounting for covariation among anxious-fearful and depressive disorders (Kendler, Prescott, Myers, & Neale, 2003; Krueger, 1999b; Krueger et al., 1998). Work subsequent to this extended the idea of an externalizing spectrum beyond traditional psychiatric constructs by demonstrating that disinhibitory personality traits, indexed, for example, by reversed scores on the Constraint factor of the Multidimensional Personality Questionnaire (MPQ; Tellegen & Waller, 2008), loaded appreciably with symptoms of substance dependence and antisocial behavior on a common externalizing factor (Krueger et al., 2002). This follow-up work hinted at the trait-like nature of the broad externalizing factor.

Findings from behavior genetics studies, described in more detail below, lent further support to the idea of the externalizing factor as a core trait-dispositional propensity toward impulse control problems. In particular, twin studies revealed an important shared genetic contribution toward various problems within the externalizing domain. For example, genetic factors play a dominant role in explaining the observed relationship between pathological gambling and antisocial behavior in childhood and adulthood (Slutske et al., 2001), indicating that this condition is part of a broader spectrum of disinhibitory problems, undergirded by a common dispositional liability (Slutske et al., 2000). Similarly, the general externalizing factor, operationalized as the factor in common among psychiatric disorders and disinhibitory personality traits, has been demonstrated to be highly heritable (~80%; Kendler et al., 2003; Krueger et al., 2002; Young, Stallings, Corley, Krauter, & Hewitt, 2000).

#### Hierarchical–Dimensional Conceptualization of Disinhibitory Problems: The Externalizing Spectrum Model

# Further Refinement and Operationalization of the Externalizing Spectrum Model

The previously mentioned lines of evidence pointed to the possibility of a general liability factor or process underlying behavioral problems of differing types, and to disinhibitory personality as an indicator of this general liability. Of note, prior work on internalizing psychopathology yielded a similar integrative, dimensional framework for understanding the convergence and divergence among various mood and anxiety problems. In particular, Clark and Watson (1991) framed anxiety and mood problems as sharing the expression of general distress (negative affectivity), with each condition also demonstrating unique/diverging characteristics (physiological hyperarousal vs. low positive affect/anhedonia, respectively). Stated another way, data from studies of internalizing disorders pointed to their hierarchical structure, with findings indicating common (dimensional) phenotypic and genetic underpinnings along with some degree of lower-order specificity for individual disorders of these types (Mineka, Watson, & Clark, 1998).

Advocates of the externalizing spectrum model have similarly applied a hierarchical–dimensional organizing framework to disorders of impulse control. As alluded to earlier, formulation of this framework was based on data from several studies that examined the phenotypic and genetic structure of externalizing spectrum pathology in samples of twin pairs. Young and colleagues (2000), for example, operationalized general externalizing proneness in an adolescent sample as the factor in common among four variables: conduct disorder and attention-deficit/hyperactivity disorder (ADHD) assessed via interview, and novelty seeking and substance experimentation assessed through self-report. Genetic modeling analyses indicated that externalizing proneness (behavioral disinhibition) was highly heritable (84%), implying that a range of adolescent problem behaviors may share a common genetic etiology. Findings from other studies using somewhat different sets of indicator variables yielded similarly high heritability coefficients (e.g., Kendler et al., 2003; Krueger et al., 2002). Taken together, these findings supported the notion of a spectrum of personality and psychopathology reflecting deficient impulse control that is accounted for substantially by genetic as opposed to environmental influences (Krueger et al., 2002). Other work has demonstrated that the overall genetic architecture of externalizing (and internalizing) disorders is largely similar across genders (with women differing from men mainly in terms of lower mean levels on the general factor; Hicks, Blonigen, et al., 2007; Krueger et al., 2002), and that common genetic factors account for liability to manifest externalizing (and, separately, internalizing) disorders in general, while also supporting the existence of specific etiological factors for particular externalizing disorders (Kendler et al., 2003; Krueger et al., 2002).

Although the foregoing work relied on samples of individuals assessed using clinical diagnostic interviews, the externalizing spectrum conceptualization was subsequently mapped out more comprehensively by Krueger, Markon, Patrick, Benning, and Kramer (2007). These authors formulated a unifying quantitative model of the externalizing spectrum as a whole, in the form of a 415-item self-report instrument for use in research on disinhibitory psychopathology, titled the Externalizing Spectrum Inventory (ESI). The ESI comprises 415 items organized into 23 unidimensional facet scales tapping a wide variety of externalizingrelated problems and behaviors. Item-level psychometric and scale-level structural analyses of data for the ESI scales from male and female community participants and incarcerated offenders yielded a structurally coherent model of externalizing pathology, with comparisons of alternative structural models yielding the best fit for a bifactor (or hierarchical) model.

The ESI bifactor model, depicted in Figure 6.1, includes a general externalizing factor on which all ESI facet scales load, along with two subordi-



**FIGURE 6.1.** Schematic depiction of the best-fitting confirmatory bifactor model of the ESI (Krueger et al., 2007; Patrick et al., 2013).  $S_1-S_{10}$  denote facet scales of the ESI (all 23 scales were included in the actual statistical model, but the number is reduced in the figure to simplify graphic representation). All ESI facet scales exhibited loadings on the *general externalizing factor*, with the largest loadings for Problematic Impulsivity and Irresponsibility subscales. Additionally, the model includes two specific factors (independent from each other and from the general factor) reflecting *callous–aggressive* tendencies and *substance abuse* behaviors. Subscales with prominent loadings on the callous–aggression factor included Relational Aggression, Empathy (reversed), Destructive Aggression, Excitement Seeking, Physical Aggression, Rebelliousness, and Honesty (reversed), whereas subscales loading on the substance abuse factor included Marijuana Use, Marijuana Problems, Drug Use, Drug Problems, and Alcohol Use, and Alcohol Problems.

nate factors (subfactors) accounting for residual covariance among certain scales not accounted for by the general factor. Note that in contrast to a higher-order model in which a general factor directly accounts for covariance among correlated lower-order subfactors, the bifactor model emphasizes how the general factor and the subfactors are distinct from one another, as opposed to how they overlap. In the ESI bifactor model, all ESI facet scales load onto the general factor, with the largest loadings evident for the Problematic Impulsivity and Irresponsibility subscales-indicating that the general factor strongly reflects weak behavioral restraint and unreliable, feckless tendencies. The two subfactors in the ESI model reflect callous-aggressive tendencies (with prominent loadings for Empathy [reversed], Relational Aggression, and Destructive Aggression subscales) and abuse of substances (with loadings for scales indexing use and problems with alcohol, marijuana, and other drugs).

Following publication of the article on the development of the ESI instrument and model, initial validation studies were undertaken using preliminary shortened versions of the ESI. One study by Venables and Patrick (2012), focusing on a sample of 235 male prisoners, reported on convergent and discriminant relations for the ESI general factor (labeled "Disinhibition") and its two subfactors (Callous-Aggression, Substance Abuse) in relation to various criterion measures, including interview-based measures of externalizing disorder symptoms along with interview and self-report measures of psychopathy. Scores on the ESI general Disinhibition factor showed expected robust associations with (1) a composite index of externalizing disorder symptoms, (2) broad MPQ traits of constraint and negative emotionality, known to correlate with externalizing psychopathology (Krueger, 1999a; Krueger, Caspi, Moffitt, Silva, & McGee, 1996), and (3) impulsive-antisocial (Factor 2) symptoms of psychopathy as assessed both by self-report (Psychopathic Personality Inventory [PPI]; Lilienfeld & Andrews, 1996; Lilienfeld & Widows, 2005) and interview (Psychopathy Checklist—Revised [PCL-R]; Hare, 2003). By contrast, scores on the ESI Callous-Aggression subfactor showed selective associations with measures reflecting affective-interpersonal features of psychopathy (e.g., scores on Factor 1 of the PCL-R; self-reported narcissistic tendencies, especially exploitativeness and entitlement), supporting a distinction between disinhibitory and callous-aggressive tendencies in psychopathy (Frick & Marsee, Chapter 19, this volume; Patrick, Fowles, & Krueger, 2009). Other studies utilizing a 100-item version of the ESI designed to index general disinhibitory tendencies demonstrated expected negative relations with P300 and errorrelated negativity (ERN) brain response measures (Hall, Bernat, & Patrick, 2007; Nelson, Patrick, & Bernat, 2011). These and other findings provide support for the validity of the ESI as a self-report measure of externalizing psychopathology that organizes problems within this domain around broad factors with distinctive external correlates.

Recently, an effort was made to formalize an abbreviated version of the ESI to serve as a more efficient alternative to the full-length (415-item) version. Developed using item-response analyses and structural modeling techniques along with more conventional psychometric methods, the 160-item ESI Brief Form (ESI-BF; Patrick, Kramer, Krueger, & Markon, 2013) provides effective coverage of the inventory's 23 lower-order facets, with a scale-level factor structure mirroring that of the full-form inventory. In addition to narrow facet scales, the ESI-BF also included item-based scales (composed of selected items from certain facet scales) for indexing the broad factors of the inventory (general disinhibition, callous-aggression, and substance abuse). As we discuss in the next section, the 20-item General Disinhibition and 19-item Callous-Aggression factor scales of the ESI-BF correspond to the Disinhibition and Meanness subscales, respectively, of the Triarchic Psychopathy Measure (TriPM; Patrick, 2010).

#### Linkages between the Externalizing Spectrum Model and Psychopathy

Drawing in part on the ESI work demonstrating separable factors of general disinhibition and callous-aggression (along with substance abuse) underlying problems in the externalizing spectrum, Patrick and colleagues (2009) postulated that the construct of psychopathy encompasses separable phenotypic components of disinhibition (general externalizing proneness) and meanness (disaffiliated agency), along with a third component, boldness (fearless dominance). Other points of reference for Patrick and colleagues' three-component (triarchic) model of psychopathy included historical writings emphasizing cruel, exploitative tendencies along with reckless-impulsive tendencies in psychopathic criminals (e.g., McCord & Mc-Cord, 1964); research on child psychopathy delineating a callous-unemotional symptom dimension distinct from impulsive conduct problems (Frick & Marsee, Chapter 19, this volume); and distinct representation of features corresponding to callous–unemotional traits in the PCL-R, PPI, and other measures of psychopathy (e.g., Andershed, Kerr, Stattin, & Levander, 2002; Miller, Lynam, Widiger, & Leukefeld, 2001; see also Lynam, Miller, & Derefinko, Chapter 11, this volume). A basic tenet of the triarchic model is that these three phenotypic–dispositional constructs—disinhibition, meanness, and boldness—are represented to varying degrees in all historic and contemporary conceptions of psychopathy and inventories developed to assess for psychopathy.

The TriPM (Drislane, Patrick, & Arsal, 2014; Patrick, 2010) was developed as a specific operationalization of the triarchic model (for discussion of other operationalizations, see Patrick & Drislane, 2015). The Disinhibition and Meanness scales of the TriPM are equivalent to the itembased General Disinhibition and Callous-Aggression factor scales of the ESI-BF; the TriPM also includes a Boldness scale that indexes fearlessdominant tendencies. The TriPM's Disinhibition and Meanness scales show expected convergent and discriminant relations with various criterion measures of impulsive-disinhibitory and callousunemotional tendencies (Drislane et al., 2014; Poy, Segarra, Esteller, López, & Moltó, 2014; Sellbom & Phillips, 2013; Stanley, Wygant, & Sellbom, 2013). For example, TriPM Disinhibition scores correlate with the Impulsive-Antisociality factor of the PPI, Five Factor Model (FFM) traits of Neuroticism and Conscientiousness (reversed), and impulsive fun-seeking. By contrast, TriPM Meanness is preferentially associated with scores on the Affective facet of the PCL-R, the Coldheartedness subscale of the PPI, the FFM's Antagonism (i.e., Agreeableness reversed), scales designed to index the callous-unemotional construct from the child psychopathy literature, and other measures indexing empathic, narcissistic, and Machiavellian tendencies. These findings provide support for the validity of the TriPM Disinhibition and Meanness scales as indices of distinct psychopathy-relevant constructs.

Importantly, and in line with the triarchic model formulation, the subscales of the TriPM account for appreciable variance in different inventories that have been developed to assess psychopathy, with the extent of overall relationship varying with the content coverage of the inventory in question, and whether the inventory is self-report or interview based (i.e., reflecting same or different measurement modality; Blonigen et al., 2010). All general psychopathy inventories evaluated in relation to the TriPM to date contain variance related to its Disinhibition and Meanness scales, with many (including the PCL-R and its questionnaire counterpart, the Self-Report Psychopathy Scale; Paulhus, Hemphill, & Hare, 2009) also containing variance related to the TriPM's Boldness scale. For self-report psychopathy inventories that include representation of boldness, the aggregate level of prediction of psychopathy total scores from the three TriPM subscales is high (multiple R's ranging from .6 to .8), with all TriPM scales contributing uniquely to prediction (Drislane et al., 2014; Sellbom & Phillips, 2013); for self-report psychopathy inventories that do not include representation of boldness, the aggregate prediction level is moderate (R's of .4-.6), with TriPM Disinhibition and Meanness scales each accounting for unique variance. The aggregate level of prediction for PCL-R psychopathy, which contains some representation of boldness along with strong representation of disinhibitory and callous-aggressive tendencies, but is assessed through use of a clinical interview and review of file information rather than by selfreport, is moderate ( $R \sim .5$ ; Venables et al., 2014; see also Wall, Wygant, & Sellbom, 2015).

In summary, the triarchic model (Patrick et al., 2009) posits that two of three distinct phenotypic facets of psychopathy (disinhibition and meanness) correspond to two of three factors underlying the externalizing spectrum of psychopathology (general externalizing proneness and callous-aggression). The third facet of the triarchic model, boldness, is considered etiologically distinct from general externalizing proneness, and thus peripheral to the externalizing spectrum model-although it intersects with the callous-aggression (meanness) subdimension of the externalizing model (Drislane et al., 2014; Drislane & Patrick, 2017). Notably, writers in the psychopathy literature have made the case that callous-unemotional or antagonistic-exploitative tendencies are most central to the diagnosis of psychopathy in antisocial samples (e.g., Frick & Marsee, Chapter 19, this volume; Lynam et al., Chapter 11, this volume; McCord & McCord, 1964). From this perspective, the callous-aggression factor of the externalizing model comprises the major point of intersection with the concept of psychopathy-with the general disinhibitory factor (like boldness) ancillary to callous-aggression. In turn, the third factor of the externalizing spectrum model, substance abuse proneness, which relates to psychopathy only as a function of its association with general externalizing proneness (Venables & Patrick, 2012), would be seen as a correlate of psychopathy (i.e., a specific behavioral expression of its disinhibitory facet) rather than a defining feature. This point is discussed further in the section "Neurophysiological Indicators of Externalizing Proneness," below, while intersections between factors of the externalizing spectrum model and constructs of the triarchic models are illustrated in Figure 6.2.

A further point is that the externalizing spectrum model provides a useful reference point for distinguishing between psychopathy and antisocial personality disorder (ASPD) as defined in the main diagnostic part (Section II) of the fifth edition of the DSM (DSM-5; APA, 2013). The criteria for the categorical diagnosis of ASPD in DSM-5, carried over without revision from DSM-IV, index tendencies associated with the general disinhibition and callous–aggression factors of the externalizing model, but not with boldness (Venables et al., 2014; Wall et al., 2015). Indeed, child and adult symptoms of ASPD were used as indicators in Krueger and colleagues' (2002) disorder-based structural model of the externalizing domain. However, in the subsequent elaboration of the model by Krueger and colleagues (2007), symptoms of ASPD (e.g., dishonesty, aggressiveness, lack of remorse, impulsivity, irresponsibility, theft) were parsed and used as indicators of narrower facet constructs among those represented in the ESI. As noted earlier, factor analysis of the ESI's 23 facet scales revealed a structure in which disinhibitory and callous-aggressive tendencies (along with substance abuse proneness) were clearly differentiated.

In addition to the traditional criterion-based diagnosis of ASPD in Section II of DSM-5, the manual also includes a trait-based diagnostic conception as part of a new dimensional system



**FIGURE 6.2.** Conceptual illustration of the overlap between factors of the externalizing spectrum model and constructs of the triarchic psychopathy model. The general externalizing proneness and callous–aggression factors of the externalizing spectrum model correspond to the disinhibition and meanness constructs, respectively, of the triarchic model. In contrast, the boldness construct of the triarchic model (reflecting fearless–dominant tendencies) is considered etiologically distinct from general externalizing proneness and thus peripheral to the externalizing spectrum model (although it intersects with callous–aggression). The substance abuse factor of the externalizing spectrum model, which overlaps selectively with the general externalizing factor (corresponding to disinhibition in the triarchic model), is viewed as a correlate rather than a facet of psychopathy.

for personality pathology in Section III, titled "Emerging Measures and Models." Recent research (Anderson, Sellbom, Wygant, Salekin, & Krueger, 2014; Strickland, Drislane, Lucy, Krueger, & Patrick, 2013) indicates that this alternative ASPD conception, which encompasses traits from broad domains of Disinhibition, Antagonism, and Negative Affect, provides more balanced coverage of disinhibition and meanness constructs as indexed by the TriPM than the Section II diagnosis (which reflects disinhibition more than meanness; Venables & Patrick, 2012). Of note, a trait-based diagnostic specifier is also included in the Section III conception for use in designating a classically lowanxious, socially dominant (i.e., "primary" psychopathic; Karpman, 1941; Lykken, 1995) variant of ASPD. This specifier exclusively reflects boldness (Strickland et al., 2013).

The inclusion of a diagnostic specifier that reflects boldness in the DSM-5 Section III conception of ASPD highlights a major distinction between individuals high in externalizing proneness and those diagnosable as psychopathic: As a whole, individuals high in disinhibitory tendencies show heightened negative affectivity (i.e., anxiousness, distress, dysphoria), in contrast with the emotional detachment characteristic of psychopathic individuals. This is illustrated by the well-established finding that internalizing and externalizing factors of psychopathology are positively correlated, both in child and adult samples (e.g., Achenbach & Edelbrock, 1978; Krueger, 1999a), which means that many individuals high in externalizing tendencies also show elevated levels of anxious/depressive problems. However, psychopathic individuals as classically described (Cleckley, 1941/1976) are an exception to this: While high in impulsive-externalizing tendencies, individuals considered psychopathic are low in negative emotion and lacking in internalizing problems. From the perspective of the triarchic model (Patrick et al., 2009), it is the presence of high meanness or high boldness, or both in combination, which accounts for the emotional detachment that distinguishes psychopathic individuals from other high-externalizing individuals.

### **Empirical Correlates of General Externalizing Proneness**

The general disinhibitory or externalizing proneness factor identified by the previously noted structural modeling work has been shown to correlate reliably with a wide range of biopsychosocial and health-related outcome variables from different measurement domains (e.g., self-report, behavioral, psychophysiological). The following section reviews empirical evidence for relationships between measures of these various types and externalizing proneness in different contexts. Corresponding coverage of empirical correlates of callous–aggressive (aka callous–unemotional, or meanness) is provided by Viding and Kimonis (Chapter 7, this volume).

#### **Psychiatric Constructs**

In terms of relationships with other psychiatric conditions, general externalizing proneness as indexed by the Disinhibition factor scale of the ESI-BF (equivalent to the TriPM Disinhibition scale) shows robust associations as expected with symptom counts for alcohol, cannabis, and other drug use disorders, and positive associations as well with the subcategory of internalizing disorders characterized by pervasive distress (i.e., major depression, dysthymic disorder, generalized anxiety disorder; Nelson, Strickland, Krueger, Arbisi, & Patrick, 2016). These findings connect in turn to other data linking externalizing proneness to various psychiatric and behavioral conditions entailing deficient inhibitory control and/or affect dysregulation, including cigarette smoking (Whalen, Jamner, Henker, & Delfino, 2001), cannabis use (Korhonen et al., 2010), pathological gambling (Grant, Odlaug, & Chamberlain, 2016; Slutske et al., 2001), and suicidal behavior (Verona, Sachs-Ericsson, & Joiner, 2004). Taken together, these commonalities imply that quantitative models of general disinhibitory proneness can be formally extended to take into account these and other problem behaviors.

Externalizing proneness also relates to symptoms of ADHD, for which weak behavioral inhibition is considered by some to be the core underlying pathology (e.g., Barkley, 1997). It is noteworthy that the magnitude of this externalizing-ADHD association varies as a function of the particular subtype of ADHD: The predominantly inattentive type is not considered to involve inhibitory deficits corresponding to externalizing proneness (Barkley 1997), whereas the predominantly hyperactive-impulsive and combined types clearly involve externalizing-related impairments (e.g., impaired performance on executive function tasks; deficient activation in frontal and prefrontal brain regions; Barkley, 1997; Patrick, Foell, Venables, & Worthy, 2015).

135

In addition, interesting links between externalizing proneness and posttraumatic stress disorder (PTSD) have been reported. For example, youth with PTSD exhibit higher rates of externalizing problems than nontraumatized controls or traumatized youth without PTSD symptoms (Saigh, Yasik, Oberfield, Halamandaris, & McHugh, 2002). Miller, Greif, and Smith (2003; Miller, Kaloupek, Dillon, & Keane, 2004) hypothesized that preexisting tendencies toward externalizing versus internalizing pathology account for different phenotypic expressions of trauma-induced distress. Support for this hypothesis came out of work demarcating subtypes of PTSD based on the presence of comorbid externalizing versus internalizing symptoms: Although PTSD is associated with elevations in both types of psychopathology, patients with PTSD who are concurrently high in externalizing tendencies show more antagonism toward others and society, whereas those high in internalizing tendencies display more social avoidance and anhedonia (Miller et al., 2003). Highexternalizing patients with PTSD also show high and low scores, respectively, on broad personality dimensions of negative emotionality and constraint, as well as higher rates of alcohol problems and antisocial personality symptoms, whereas internalizing-prone individuals with PTSD display higher rates of comorbid major depression and panic disorder (Miller et al., 2004).

The coherence of externalizing disorders has been further demonstrated using latent class analysis, which takes a person-centered (rather than variable-centered) approach to identifying patterns or profiles of comorbidity among differing psychiatric conditions. In parallel with results from factor-analytic studies of externalizing proneness, latent-class modeling work reveals a distinct subgroup (class) of individuals exhibiting comorbid externalizing conditions including alcohol abuse, other drug use disorders, and conduct disorder (Vaidyanathan, Patrick, & Iacono, 2011)—along with other classes, including a fear disorders class, a distress disorders subgroup, and a multimorbid subgroup exhibited high rates of multiple disorders. This latter class appears to represent the broad and severe psychiatric disturbance that arises in a subset of individuals, perhaps due to combined dispositional liabilities.

Other evidence for interplay between externalizing and internalizing conditions was provided by Nelson and colleagues (2016), who reported interactive effects of disinhibition and trait fear (akin to boldness [reversed]; Drislane et al., 2015; Kramer, Patrick, Krueger, & Gasperi, 2012) in predicting phobic-fear and distress disorder symptomatology, with individuals high on both trait dimensions especially likely to exhibit symptoms of such disorders. This synergy of externalizing proneness and dispositional fear is also evident for affect-driven behavior in the form of self-harm: In two separate large samples consisting of young males from the community and adult clinic outpatients, Venables and colleagues (2015) reported that the presence of these two traits together was associated with markedly enhanced risk for suicidal behavior. These findings suggest that externalizing plays a role (both on its own and in combination with other personality traits) in the affect dysregulation that is associated with mood and other conditions, as well as suicidal or self-harm behavior. Of note, the finding that disinhibitory tendencies are associated with markedly less risk for suicide when accompanied by low trait fear (i.e., high boldness) as compared to high trait fear is consistent with clinical-observational (e.g., Cleckley, 1941/1976) and empirical evidence (e.g., Douglas et al., 2008; Verona, Hicks, & Patrick, 2005) for reduced risk of suicide among classically psychopathic individuals compared to both psychiatric patients and criminal offenders lacking in affective-interpersonal features of psychopathy.

### Personality Traits

In addition to correlating with MPQ broad-trait dimensions of constraint and negative emotionality, as described earlier, externalizing proneness shows parallel associations (negative and positive, respectively) with FFM dimensions of Conscientiousness and Neuroticism (e.g., Griffith et al., 2010) and measures of Agreeableness and emotional instability (Tackett, Herzhoff, Reardon, De Clercq, & Sharp, 2014). FFM conscientiousness, a broad construct that includes multiple facets related to inhibitory control (i.e, self-discipline, deliberation, dutifulness, order; Costa, Fagan, Piedmont, Ponticas, & Wise, 1992), consistently predicts a wide range of health-related behaviors and outcomes (Reiss, Eccles, & Nielsen, 2014)-including biological indices of physical health (e.g., metabolic functioning, cardiorespiratory fitness, periodontal disease, systemic inflammation) and life success (e.g., education, health, crime, parenting style, life satisfaction) across multiyear follow-up periods (Israel & Moffitt, 2014; Moffitt et al., 2011). Conscientiousness also predicts responsiveness to behavioral interventions (e.g., Christensen, 2000), indicating that personality traits within this domain may be useful to consider in formulating individualized (precision) treatments for medical as well as psychological conditions. Taken together, the literature on correlates of Conscientiousness illustrates the broad reach that the construct of inhibitory control versus disinhibition has on individuals' health and well-being.

#### Laboratory Measures of Inhibitory Control

Externalizing proneness also relates to patterns of dysregulated behavior and maladaptive decision making in laboratory and neuropsychological testing contexts. For example, abstinent alcohol-dependent individuals make more disadvantageous choices in simulated gambling tasks (Fein, Klein, & Finn, 2004), and adolescents prone to externalizing disorders display deficient behavioral control across various tasks. Relevant to the latter, a largescale twin study by Young and colleagues (2009) used data collected at different ages (12 and 17) to examine the stability of externalizing proneness (trait disinhibition) across time, to evaluate its relationship with executive function (EF) as indexed by performance on inhibitory control tasks, and to clarify the etiological basis of this relationship. Symptom and trait-scale measures of externalizing proneness were collected along with lab-behavioral tasks indexing the ability to override prepotent responses (i.e., Stroop, stop-signal, antisaccade; see Miyake & Friedman, 2012, for discussion of these tasks as indices of EF capacity). Factors of trait disinhibition and response inhibition were defined, respectively, in terms of covariance among externalizing-proneness measures and among behavioral-task measures. A robust negative relationship was evident between the trait disinhibition factor and the task-based responseinhibition factor at both ages, and twin-modeling analyses showed that this association was attributable largely to shared genetic influences.

This work has important implications for conceptualization and assessment of externalizing proneness (trait disinhibition) as a symptomatic facet of psychopathy. It provides support for the idea that a common dispositional liability underlies impulse-related problems of various types and affiliated traits, and it provides evidence for continuity of this liability as indexed by symptom and trait-scale measures from earlier to later ages. Additionally, the work of Young and colleagues (2009) provides evidence for a genetically based relationship between this liability as indexed by symptom and trait-scale variables and the factor in common among task measures of inhibitory control capacity, and demonstrates continuity of this relationship across age points. Considered from a classic construct validity standpoint (Cronbach & Meehl, 1955), these findings indicate that the nomological (construct) network of trait disinhibition encompasses phenomena in the domain of behavioral (EF-task) response, along with phenomena in the domains of clinical symptomatology and reported personality characteristics. As described in the next section, there is evidence that the construct network of trait disinhibition also includes phenomena in the domain of neurophysiology (i.e., brain responses). Following a review of this evidence, we consider how findings as a whole regarding the correlates of externalizing proneness (disinhibition) point to the possibility of a multidomain framework for assessing and studying this important psychopathology construct.

#### Neurophysiological Indicators of Externalizing Proneness

There is abundant evidence for neurophysiological differences between people high and low in externalizing proneness. For example, externalizing proneness (trait disinhibition) has been related to differential autonomic (heart rate and electrodermal) activity, with externalizing-prone individuals showing lower baseline levels of autonomic activity but heightened reactivity to laboratory stressors (Lorber, 2004; Ortiz & Raine, 2004). Other work indicates that higher externalizing proneness is also associated with dysfunction in the vagal autonomic–regulatory system, and heightened activation of striatal dopamergic circuitry in relation to reward cues and amphetamine administration (Buckholtz et al., 2010a, 2010b).

At the same time, other research has demonstrated reliable *reductions* in event-related brain potential (ERP) responses among high-disinhibited (externalizing-prone) individuals in cognitive processing tasks. Some work has revealed reduced amplitude of the ERN—a negative-polarity ERP that follows incorrect behavioral responses in a visual discrimination task, and is believed to index online monitoring of performance mediated by anterior brain systems—in relation to impulsive personality traits (e.g., Dikman & Allen, 2000; Pailing & Segalowitz, 2004) and externalizing proneness specifically (Hall, Bernat, & Patrick, 2007). However, the best established neurophysiological correlate of trait disinhibition is reduced amplitude of the P300 brain response to target stimuli in the so-called "oddball" task paradigm. Two studies, by Hicks, Bernat, and colleagues (2007) and Yancey, Venables, Hicks, and Patrick (2013), used twin modeling analyses to demonstrate evidence of a genetic basis to this observed (phenotypic) association. Interestingly, the finding of reduced P300 for high-disinhibited individuals extends beyond oddball task target stimuli, having been shown for other variants of this response. For example, Nelson, Patrick, and Bernat (2011) reported negative relations for trait disinhibition with P3 responses from two non-oddball tasks, a flanker discrimination task, and a gamblingfeedback task. When these two P3 variables were combined together with ERN response from the flanker task into an ERP composite, scores on this composite predicted externalizing-related criterion measures (i.e., substance problems, antisocial behavior, and disinhibitory personality) and predicted P3 responses to both target and novel nontarget stimuli in a visual oddball paradigm.

In considering the findings of Nelson and colleagues (2011), it is important to distinguish between the ERN response following errors and a counterpart response and the feedback-related negativity (FRN) that occurs in response to cues signaling loss versus gain outcomes. Whereas the ERN is thought to reflect internal recognition of errors when performing a task, the FRN response reflects the brain's response to explicit external feedback regarding the outcome of a choice. Bernat, Nelson, Steele, Gehring, and Patrick (2011) demonstrated that, in contrast to the ERN (Hall et al., 2007), the FRN is not associated with externalizing proneness. This suggests that individuals high in externalizing proneness are deficient in endogenous error monitoring, but intact in monitoring of external (exogenous) cues. Bernat and colleagues also reported a dissociation between effects for earlier and later components of brain response to feedback stimuli, using the method of time-frequency analysis to separate out initial registration of feedback stimuli (reflected in theta frequency, FRN reactivity) from subsequent postperceptual processing (reflected in delta frequency, P300 reactivity). These two components of feedback response were differentially related to externalizing proneness: High-externalizing individuals showed normal amplitude of the earlier theta-FRN response to feedback stimuli, but reduced amplitude of later delta-P300 response to these stimuli. The implication is that these individuals processed the loss versus gain content of the feedback in a typical manner but did not engage in normal elaborative–associative processing of the feedback (cf. Patrick & Bernat, 2009).

Studies using functional magnetic resonance imaging (fMRI) have provided further evidence for selective processing deficits in high-disinhibited individuals. In one fMRI study, Foell and colleagues (2016) tested for associations of trait disinhibition with brain reactivity in an implicit affective cueing paradigm. Participants viewed picture stimuli in blocks containing either pleasant and neutral pictures or unpleasant and neutral pictures, and were cued in advance of each picture so they could anticipate its occurrence. While cues were nonspecific as to the affective valence of each upcoming picture, the blocked presentation format allowed for implicit expectancies to develop within blocks of each type. High-disinhibited participants (relative to low-disinhibited) showed decreased nucleus accumbens activation during anticipation of pictures within pleasant/neutral blocks compared to unpleasant/neutral blocks, and increased activation of the amygdala during actual viewing of affective pictures compared to neutral. Further analysis showed that the increased subcortical brain reactivity during affective picture viewing in high-disinhibited participants was mediated in part by the reduced preparatory activation. This pattern of results, which contrasts with findings of enhanced brain activation to explicit cues for affective outcomes (reward in particular; Buchholtz et al., 2010a, 2010b), is consistent with the idea of a stimulus-driven mode of information processing in externalizing-prone individuals (Patrick & Bernat, 2009)—in which environmental events are registered and responded to as they occur, with reduced utilization of contextual information to anticipate and prepare for events, and reduced associativeelaborative processing ("reflectivity"; Patterson & Newman, 1993) following their occurrence.

A study by Abram and colleagues (2015) that used fMRI to investigate functional connectivity among various brain structures during a rest period found differences in intrinsic connectivity networks involving the insula in high- versus low-externalizing participants. The differences were evident for the general disinhibitory factor underlying externalizing tendencies rather than for its specific expression in the form of substancerelated problems. In another fMRI study, utilizing over 2,000 adolescent participants, Castellanos-Ryan and colleagues (2014) identified additional brain regions associated with externalizing proneness. These authors examined differences in neural activation associated with successful interruptions in responding (i.e., behavioral inhibition) in a stop-signal task. On successful "stop" trials, high-externalizing participants showed increased activation of the presupplementary motor area and precentral gyrus, along with reduced activation of the substantia nigra and subthalamic nucleus. The authors interpreted these results as evidence for dysfunctional processing in brain areas linking expectation of reward to specific action mobilization.

## Conclusions and Future Directions: Toward a Multidomain Framework for Assessing and Understanding Disinhibitory Liability and Its Relationship to Psychopathy

As described in the previous sections, general externalizing proneness is a coherent, well-studied construct representing trait liability toward disinhibitory problems of varying kinds. Although initially defined using rating measures (i.e., interview and self-report assessments of disorder symptoms and related personality traits), a growing body of research documents reliable relationships for externalizing proneness as operationalized by rating approaches with measures of other types, including cognitive, neurological, and autonomic-physiological measures. This accumulating body of data indicates that the concept of externalizing proneness transcends the domain of psychological ratings and can be quantified using combinations of indicators from different domains. This idea underlies recent work by Patrick and colleagues (2013) integrating measures of different types to advance conceptual understanding and quantification of externalizing proneness.

Specifically, Patrick and colleagues (2013) used the construct of externalizing proneness to illustrate how combining variables from different domains of measurement (i.e., self-report scale and brain response) can help to clarify neurobiological processes contributing to impulse control problems, by bridging across clinical-psychological and neural reactivity domains. Building on prior work showing interrelations among alternative brain indicators of externalizing proneness (Nelson et al., 2011), these investigators showed that (1) different psychometric scale and brain-response indicators of trait disinhibition (two of each) loaded on a common factor, interpretable as a joint psychometric–neurophysiological ("psychoneurometric") dimension of disinhibitory tendencies; (2) scores on this psychoneurometric dimension showed robust predictive associations with both clinical symptom and brain response criterion measures; and (3) these predictive associations held up in a separate cross-validation sample. Based on these findings, Patrick and colleagues proposed that trait disinhibition is a latent construct that is expressed in multiple domains of measurement and can therefore be operationalized using indicators from different domains.

Other research by Young and colleagues (2009), described earlier, indicates that trait disinhibition is expressed as well in the domain of behavioral performance (i.e., in scores on lab-task measures of inhibitory control, an aspect of EF). Considering this work together with that of Patrick and colleagues (2013), it appears that the potential exists for establishing a multidomain, multimeasure (Campbell & Fiske, 1959) framework for quantifying and studying individual differences in trait disinhibition. Figure 6.3 provides an illustration of this type of framework, focusing on indicators from three broad domains of measurement: ratings, behavior, and neurobiology. Each of these domains can be parsed into subdomains (e.g., ratings into self, informant, and interviewer; behavioral into task-performance, lab-observational, and in vivo observational; neurobiological into electrocortical, fMRI, neuroanatomic, neurochemical). With advances in understanding of the molecular genetic basis of externalizing proneness (e.g., Dick, 2007; Salvatore et al., 2015), the framework could conceivably be expanded to include indicators from the genomic domain. Ultimately, this approach could free researchers to advance understanding of disinhibition through diverse measurement and quantitative modeling techniques, leading to the development of a rich nomological network that can lead the field to reconceptualize the construct in terms that extend beyond our current rating-based perspective.

This multidomain, multimeasure research strategy is likely to be fruitful for advancing understanding of psychopathy more broadly given the relevance of trait disinhibition to psychopathy, and through its application to other facets of psychopathy (i.e., meanness/callous aggression, boldness/low trait fear; Patrick et al., 2009). From this perspective, an important goal for future research will be to develop a richer network of findings regarding intersections among rating, behavioral, and neurobiological indicators of these distinguishable facets of psychopathy. Efforts to establish



**FIGURE 6.3.** Schematic illustration of a multidomain, multimeasure latent variable model of a trait dimensional/psychiatric construct (e.g., disinhibition). Squares reflect observed (manifest) variables derived from rating-based (R; i.e., interview or self-report; depicted by solid lines), behavioral-task (B; depicted by dotted lines), and neurobiological (N; depicted by dashed lines) methods. The figure shows how disinhibition (or another trait dimension relevant to psychopathy) could be modeled as a common factor accounting for the covariance among observed indicators from multiple measurement domains, with separate factors specified to account for systematic method variance associated with each measurement domain.

an integrated conceptualization of these distinct phenotypic–dispositional constructs, drawing on data from multiple domains of measurement, will help to keep psychopathy research at the forefront of clinical science, while also contributing to our understanding of other pressing mental health problems.

#### REFERENCES

- Abram, S. V., Wisner, K. M., Grazioplene, R. G., Krueger, R. F., MacDonald, A. W., & DeYoung, C. G. (2015). Functional coherence of insula networks is associated with externalizing behavior. *Journal of Abnormal Psychology*, 124, 1079–1091.
- Achenbach, T. M. (1966). The classification of children's psychiatric symptoms: A factor-analytic study. *Psychological Monographs*, 80, 1–37.
- Achenbach, T. M. (1974). Developmental psychopathology. New York: Ronald Press.
- Achenbach, T. M., & Edelbrock, C. S. (1978). The classification of child psychopathology: A review and analysis of empirical efforts. *Psychological Bulletin*, 85, 1275–1301.
- American Psychiatric Association. (1968). Diagnostic and statistical manual of mental disorders (2nd ed.). Washington, DC: Author.
- American Psychiatric Association. (1980). Diagnostic

and statistical manual of mental disorders (3rd ed.). Washington, DC: Author.

- American Psychiatric Association. (1987). Diagnostic and statistical manual of mental disorders (3rd ed., rev.). Washington, DC: Author.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: Author.
- Andershed, H., Kerr, M., Stattin, H., & Levander, S. (2002). Psychopathic traits in non-referred youths: Initial test of a new assessment tool. In E. Blaauw, J. M. Philippa, K. C. M. P. Ferenschild, & B. van Lodensteijn (Eds.), Psychopaths: Current international perspectives (pp. 131–158). The Hague: Elsevier.
- Anderson, J. L., Sellbom, M., Wygant, D. B., Salekin, R. T., & Krueger, R. F. (2014). Examining the associations between DSM-5 Section III antisocial personality disorder traits and psychopathy in community and university samples. *Journal of Personality Disorders*, 28, 675–697.
- Anderson, L. M. (1969). Personality characteristics of parents of neurotic, aggressive, and normal preadolescent boys. Journal of Consulting and Clinical Psychology, 33, 575–581.
- Barkley, R. A. (1997). Behavioral inhibition, sustained attention, and executive functions: Constructing a unifying theory of ADHD. Psychological Bulletin, 121(1), 65–94.
- Bernat, E. M., Nelson, L. D., Steele, V. R., Gehring, W. J., & Patrick, C. J. (2011). Externalizing psychopa-

thology and gain–loss feedback in a simulated gambling task: Dissociable components of brain response revealed by time-frequency analysis. *Journal of Abnormal Psychology*, *120*(2), *352–364*.

- Blonigen, D. M., Patrick, C. J., Douglas, K. S., Poythress, N. G., Skeem, J. L., Lilienfeld, S. O., et al. (2010). Multimethod assessment of psychopathy in relation to factors of internalizing and externalizing from the Personality Assessment Inventory: The impact of method variance and suppressor effects. *Psychological Assessment*, 22, 96–107.
- Buckholtz, J. W., Treadway, M. T., Cowan, R. L., Woodward, N. D., Benning, S. D., Li, R., et al. (2010a). Mesolimbic dopamine reward system hypersensitivity in individuals with psychopathic traits. *Nature Neuroscience*, 13, 419–421.
- Buckholtz, J. W., Treadway, M. T., Cowan, R. L., Woodward, N. D., Li, R., Ansari, M. S., et al. (2010b). Dopaminergic network differences in human impulsivity. Science, 329, 532.
- Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 56, 81–105.
- Castellanos-Ryan, N., Struve, M., Whelan, R., Banaschewski, T., Barker, G. J., Bokde, A. L., et al. (2014). Neural and cognitive correlates of the common and specific variance across externalizing problems in young adolescence. *American Journal of Psychiatry*, 171, 1310–1319.
- Christensen, A. J. (2000). Patient-by-treatment context interaction in chronic disease: A conceptual framework for the study of patient adherence. *Psychosomatic Medicine*, 62, 435–443.
- Clark, L. A., & Watson, D. (1991). Tripartite model of anxiety and depression: Psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology*, 100, 316–336.
- Cleckley, H. M. (1976). *The mask of sanity* (5th ed.). St. Louis, MO: Mosby. (Original work published 1941)
- Costa, P. T., Jr., Fagan, P. J., Piedmont, R. L., Ponticas, Y., & Wise, T. N. (1992). The five-factor model of personality and sexual functioning in outpatient men and women. *Psychiatric Medicine*, 10, 199–215.
- Cronbach, L., & Meehl, P. (1955). Construct validity in psychological tests. *Psychological Bulletin*, 21, 281–302.
- Dick, D. M. (2007). Identification of genes influencing a spectrum of externalizing psychopathology. *Current Directions in Psychological Science*, 16, 331–335.
- Dikman, Z. V., & Allen, J. J. (2000). Error monitoring during reward and avoidance learning in high- and low-socialized individuals. *Psychophysiology*, 37(1), 43–54.
- Douglas, K. S., Lilienfeld, S. O., Skeem, J. L., Poythress, N. G., Edens, J. F., & Patrick, C. J. (2008). Relation of antisocial and psychopathic traits to suicide-related behavior among offenders. *Law and Human Behavior*, 32, 511–525.

- Drislane, L. E., & Patrick, C. J. (2017). Integrating alternative conceptions of psychopathic personality: A latent variable model of triarchic psychopathy constructs. *Journal of Personality Disorders*, 31(1), 110–132.
- Drislane, L. E., Patrick, C. J., & Arsal, G. (2014). Clarifying the content coverage of differing psychopathy inventories through reference to the triarchic psychopathy measure. *Psychological Assessment*, 26, 350–362.
- Drislane, L. E., Brislin, S. J., Kendler, K. S., Andershed, H., Larsson, H., & Patrick, C. J. (2015). A triarchic model analysis of the Youth Psychopathic Traits Inventory. *Journal of Personality Disorders*, 29(1), 15–41.
- Eme, R. F. (1979). Sex differences in childhood psychopathology: A review. Psychological Bulletin, 86, 574–595.
- Fein, G., Klein, L., & Finn, P. (2004). Impairment on a simulated gambling task in long-term abstinent alcoholics. Alcoholism: Clinical and Experimental Research, 28, 1487–1491.
- Foell, J., Brislin, S. J., Strickland, C. M., Seo, D., Sabatinelli, D., & Patrick, C. J. (2016). Externalizing proneness and brain response during pre-cuing and viewing of emotional pictures. Social Cognitive and Affective Neuroscience, 11, 1102–1110.
- Freeman, M. (1971). A reliability study of psychiatric diagnosis in childhood and adolscence. Journal of Child Psychology and Psychiatry, 12, 43–54.
- Gorenstein, E. E., & Newman, J. P. (1980). Disinhibitory psychopathology: A new perspective and a model for research. *Psychological Review*, 87, 301–315.
- Grant, J. E., Odlaug, B. L., & Chamberlain, S. R. (2016). Neural and psychological underpinnings of gambling disorder: A review. Progress in Neuro-Psychopharmacology and Biological Psychiatry, 65, 188–193.
- Griffith, J. W., Zinbarg, R. E., Craske, M. G., Mineka, S., Rose, R. D., Waters, A. M., et al. (2010). Neuroticism as a common dimension in the internalizing disorders. *Psychological Medicine*, 40, 1125–1136.
- Hall, J. R., Bernat, E. M., & Patrick, C. J. (2007). Externalizing psychopathology and the error-related negativity. *Psychological Science*, 18, 326–333.
- Hare, R. D. (2003). The Hare Psychopathy Checklist— Revised. Toronto: Multi-Health Systems.
- Hicks, B. M., Bernat, E., Malone, S. M., Iacono, W. G., Patrick, C. J., Krueger, R. F., et al. (2007). Genes mediate the association between P3 amplitude and externalizing disorders. *Psychophysiology*, 44(1), 98–105.
- Hicks, B. M., Blonigen, D. M., Kramer, M. D., Krueger, R. F., Patrick, C. J., Iacono, W. G., et al. (2007). Gender differences and developmental change in externalizing disorders from late adolescence to early adulthood: A longitudinal twin study. *Journal of Abnormal Psychology*, 116, 433–447.
- Iacono, W. G., Carlson, S. R., Malone, S. M., & McGue, M. (2002). P3 event-related potential amplitude and the risk for disinhibitory disorders in adolescent boys. *Archives of General Psychiatry*, 59, 750–757.

- Iacono, W. G., Carlson, S. R., Taylor, J., Elkins, I. J., & McGue, M. (1999). Behavioral disinhibition and the development of substance-use disorders: Findings from the Minnesota Twin Family Study. *Development* and Psychopathology, 11, 869–900.
- Israel, S., & Moffitt, T. E. (2014). Assessing conscientious personality in primary care: An opportunity for prevention and health promotion. *Developmental Psychology*, 50, 1475–1477.
- Karpman, B. (1941). On the need for separating psychopathy into two distinct clinical types: Symptomatic and idiopathic. *Journal of Criminology and Psychopathology*, 3, 112–137.
- Kendler, K. S., Prescott, C. A., Myers, J., & Neale, M. C. (2003). The structure of genetic and environmental risk factors for common psychiatric and substance use disorders in men and women. Archives of General Psychiatry, 60, 929–937.
- Korhonen, T., van Leeuwen, A. P., Reijneveld, S. A., Ormel, J., Verhulst, F. C., & Huizink, A. C. (2010). Externalizing behavior problems and cigarette smoking as predictors of cannabis use: The TRAILS Study. Journal of the American Academy of Child and Adolescent Psychiatry, 49, 61–69.
- Kramer, M. D., Patrick, C. J., Krueger, R. F., & Gasperi, M. (2012). Delineating physiologic defensive reactivity in the domain of self-report: Phenotypic and etiologic structure of dispositional fear. *Psychological Medicine*, 42, 1305–1320.
- Krueger, R. F. (1999a). Personality traits in late adolescence predict mental disorders in early adulthood: A prospective-epidemiological study. *Journal of Personality*, 67, 39–65.
- Krueger, R. F. (1999b). The structure of common mental disorders. Archives of General Psychiatry, 56, 921–926.
- Krueger, R. F., Caspi, A., Moffitt, T. E., & Silva, P. A. (1998). The structure and stability of common mental disorders (DSM-III-R): A longitudinal-epidemiological study. *Journal of Abnormal Psychology*, 107, 216–227.
- Krueger, R. F., Caspi, A., Moffitt, T. E., Silva, P. A., & McGee, R. (1996). Personality traits are differentially linked to mental disorders: A multitrait–multidiagnosis study of an adolescent birth cohort. *Journal of Abnormal Psychology*, 105, 299–312.
- Krueger, R. F., Hicks, B. M., Patrick, C. J., Carlson, S. R., Iacono, W. G., & McGue, M. (2002). Etiologic connections among substance dependence, antisocial behavior, and personality: Modeling the externalizing spectrum. *Journal of Abnormal Psychology*, 111, 411–424.
- Krueger, R. F., Markon, K. E., Patrick, C. J., Benning, S. D., & Kramer, M. D. (2007). Linking antisocial behavior, substance use, and personality: An integrative quantitative model of the adult externalizing spectrum. *Journal of Abnormal Psychology*, 116, 645–666.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure

of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment*, 66, 488–524.

- Lilienfeld, S. O., & Widows, M. (2005). Psychopathic Personality Inventory—Revised professional manual. Odessa, FL: Psychological Assessment Resources.
- Lorber, M. F. (2004). Psychophysiology of aggression, psychopathy, and conduct problems: A meta-analysis. Psychological Bulletin, 130, 531–552.
- Lykken, D. T. (1995). The antisocial personalities. Hillsdale, NJ: Erlbaum.
- McCord, W., & McCord, J. (1964). The psychopath: An essay on the criminal mind. Princeton, NJ: Van Nostrand.
- Miller, J. D., Lynam, D. R., Widiger, T., & Leukefeld, C. (2001). Personality disorders as extreme variants of common personality dimensions: Can the five-factor model adequately represent psychopathy? *Journal of Personality*, 69, 253–276.
- Miller, M. W., Greif, J. L., & Smith, A. A. (2003). Multidimensional Personality Questionnaire profiles of veterans with traumatic combat exposure: Externalizing and internalizing subtypes. *Psychological Assessment*, 15, 205–215.
- Miller, M. W., Kaloupek, D. G., Dillon, A. L., & Keane, T. M. (2004). Externalizing and internalizing subtypes of combat-related PTSD: A replication and extension using the PSY-5 scales. *Journal of Abnormal Psychology*, 113, 636–645.
- Mineka, S., Watson, D., & Clark, L. A. (1998). Comorbidity of anxiety and unipolar mood disorders. Annual Review of Psychology, 49, 377–412.
- Miyake, A., & Friedman, N. P. (2012). The nature and organization of individual differences in executive functions four general conclusions. *Current Directions in Psychological Science*, 21(1), 8–14.
- Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R. J., Harrington, H., et al. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy* of Sciences of the USA, 108, 2693–2698.
- Morgan, A. B., & Lilienfeld, S. O. (2000). A meta-analytic review of the relation between antisocial behavior and neuropsychological measures of executive function. *Clinical Psychology Review*, 20, 113–136.
- Nelson, L. D., Patrick, C. J., & Bernat, E. M. (2011). Operationalizing proneness to externalizing psychopathology as a multivariate psychophysiological phenotype. *Psychophysiology*, 48, 64–72.
- Nelson, L. D., Strickland, C., Krueger, R. F., Arbisi, P. A., & Patrick, C. J. (2016). Neurobehavioral traits as transdiagnostic predictors of clinical problems. Assessment, 23, 75–85.
- Ortiz, J., & Raine, A. (2004). Heart rate level and antisocial behavior in children and adolescents: A metaanalysis. Journal of the American Academy of Child and Adolescent Psychiatry, 43, 154–162.
- Pailing, P. E., & Segalowitz, S. J. (2004). The error-related negativity as a state and trait measure: Moti-

vation, personality, and ERPs in response to errors. *Psychophysiology*, 41, 84–95.

- Patrick, C. J. (2010). Operationalizing the triarchic conceptualization of psychopathy: Preliminary description of brief scales for assessment of boldness, meanness, and disinhibition. Unpublished test manual, Florida State University, Tallahassee, FL. Available from www.phenxtoolkit.org/index.php?pageLink=browse. protocoldetails&id=121601.
- Patrick, C. J., & Bernat, E. M. (2009). From markers to mechanisms: Using psychophysiological measures to elucidate basic processes underlying aggressive externalizing behavior. In S. Hodgins, E. Viding, & A. Plodowski (Eds.), Persistent violent offenders: Neuroscience and rehabilitation (pp. 223–250). London: Oxford University Press.
- Patrick, C. J., & Drislane, L. E. (2015). Triarchic model of psychopathy: Origins, operationalizations, and observed linkages with personality and general psychopathology. *Journal of Personality*, 83, 627–643.
- Patrick, C. J., Foell, J., Venables, N. C., & Worthy, D. A. (2015). Substance use disorders as externalizing outcomes. In T. P. Beauchane & S. P. Hinshaw (Eds.), *The Oxford handbook of externalizing spectrum disorders* (pp. 38–60). New York: Oxford University Press.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, 21, 913–938.
- Patrick, C. J., Kramer, M. D., Krueger, R. F., & Markon, K. E. (2013). Optimizing efficiency of psychopathology assessment through quantitative modeling: Development of a brief form of the Externalizing Spectrum Inventory. *Psychological Assessment*, 25, 1332–1348.
- Patterson, C. M., & Newman, J. P. (1993). Reflectivity and learning from aversive events: Toward a psychological mechanism for the syndromes of disinhibition. *Psychological Review*, 100, 716–736.
- Paulhus, D. L., Hemphill, J. F., & Hare, R. D. (2009). Manual for the Self-Report Psychopathy Scale (SRP-III). Toronto: Multi-Health Systems.
- Poy, R., Segarra, P., Esteller, À., López, R., & Moltó, J. (2014). FFM description of the triarchic conceptualization of psychopathy in men and women. *Psychological Assessment*, 26, 69–76.
- Quay, H. C. (1964). Personality dimensions in delinquent males as inferred from the factor analysis of behavior ratings. *Journal of Research in Crime and Deliquency*, 1(1), 33–37.
- Quay, H. C., & Quay, L. C. (1965). Behavior problems in early adolescence. Child Development, 36, 215–220.
- Quay, H. C., Sprague, R. L., & Shulman, H. S. (1966). Some correlates of personality disorder and conduct in child guidance clinic sample. *Psychological in the Schools*, 3(1), 44–47.
- Reiss, D., Eccles, J. S., & Nielsen, L. (2014). Conscien-

tiousness and public health: Synthesizing current research to promote healthy aging. *Developmental Psychology*, 50, 1303–1314.

- Saigh, P. A., Yasik, A. E., Oberfield, R. A., Halamandaris, P. V., & McHugh, M. (2002). An analysis of the internalizing and externalizing behaviors of traumatized urban youth with and without PTSD. *Journal of Abnormal Psychology*, 111, 462–470.
- Salvatore, J. E., Meyers, J. L., Yan, J., Aliev, F., Lansford, J. E., Pettit, G. S., et al. (2015). Intergenerational continuity in parents' and adolescents' externalizing problems: The role of life events and their interaction with GABRA2. *Journal of Abnormal Psycholol*ogy, 124, 709–728.
- Sandifer, M. G., Pettus, C., & Quade, D. (1964). A study of psychiatric diagnosis. *Journal of Nervous and Mental Disease*, 139, 350–356.
- Schultz, E. W., Salvia, J., & Feinn, J. (1973). Deviant behaviors in rural elementary schoolchildren. *Journal* of Abnormal Child Psychology, 1, 378–389.
- Sellbom, M., & Phillips, T. R. (2013). An examination of the triarchic conceptualization of psychopathy in incarcerated and nonincarcerated samples. *Journal of Abnormal Psychology*, 122, 208–214.
- Slutske, W. S., Eisen, S., True, W. R., Lyons, M. J., Goldberg, J., & Tsuang, M. (2000). Common genetic vulnerability for pathological gambling and alcohol dependence in men. Archives of General Psychiatry, 57, 666–673.
- Slutske, W. S., Eisen, S., Xian, H., True, W. R., Lyons, M. J., Goldberg, J., et al. (2001). A twin study of the association between pathological gambling and antisocial personality disorder. *Journal of Abnormal Psychology*, 110, 297–308.
- Stanley, J. H., Wygant, D. B., & Sellbom, M. (2013). Elaborating of the construct validity of the Triarchic Psychopathy Measure in a criminal offender sample. *Journal of Personality Assessment*, 95, 343–350.
- Strickland, C. M., Drislane, L. E., Lucy, M., Krueger, R. F., & Patrick, C. J. (2013). Characterizing psychopathy using DSM-5 personality traits. Assessment, 20, 327–338.
- Tackett, J. L., Herzhoff, K., Reardon, K. W., De Clercq, B., & Sharp, C. (2014). The externalizing spectrum in youth: Incorporating personality pathology. *Journal of Adolescence*, 37, 659–668.
- Tellegen, A., & Waller, N. G. (2008). Exploring personality through test construction: Development of the Multidimensional Personality Questionnaire. In G. J. Boyle, G. Matthews, & D. H. Saklofske (Eds.), The SAGE handbook of personality theory and assessment: Vol. 2. Personality measurement and testing (pp. 261– 292). Thousand Oaks, CA: SAGE.
- Vaidyanathan, U., Patrick, C. J., & Iacono, W. G. (2011). Patterns of comorbidity among mental disorders: A person-centered approach. Comprehensive Psychiatry, 52, 527–535.
- Venables, N. C., Hall, J. R., & Patrick, C. J. (2014). Dif-

ferentiating psychopathy from antisocial personality disorder: A triarchic model perspective. *Psychological Medicine*, 44, 1005–1013.

- Venables, N. C., & Patrick, C. J. (2012). Validity of the Externalizing Spectrum Inventory in a criminal offender sample: Relations with disinhibitory psychopathology, personality, and psychopathic features. *Psychological Assessment*, 24, 88–100.
- Venables, N. C., Sellbom, M., Sourander, A., Kendler, K. S., Joiner, T. E., Drislane, L. E., et al. (2015). Separate and interactive contributions of weak inhibitory control and threat sensitivity to prediction of suicide risk. *Psychiatry Research*, 226, 461–466.
- Verona, E., Hicks, B. M., & Patrick, C. J. (2005). Psychopathy and suicidality in female offenders: Mediating influences of personality and abuse. *Journal of Consulting and Clinical Psychology*, 73, 1065–1073.
- Verona, E., Sachs-Ericsson, N., & Joiner, T. E., Jr. (2004). Suicide attempts associated with externalizing psychopathology in an epidemiological sample. *American Journal of Psychiatry*, 161, 444–451.
- Wall, T. D., Wygant, D. B., & Sellbom, M. (2015). Bold-

ness explains a key difference between psychopathy and antisocial personality disorder. *Psychology and Law*, 22(1), 94–105.

- Whalen, C. K., Jamner, L. D., Henker, B., & Delfino, R. J. (2001). Smoking and moods in adolescents with depressive and aggressive dispositions: Evidence from surveys and electronic diaries. *Health Psychology*, 20, 99–111.
- Yancey, J. R., Venables, N. C., Hicks, B. M., & Patrick, C. J. (2013). Evidence for a heritable brain basis to deviance-promoting deficits in self-control. *Journal of Criminal Justice*, 41(5), 309–317.
- Young, S. E., Friedman, N. P., Miyake, A., Willcutt, E. G., Corley, R. P., Haberstick, B. C., et al. (2009). Behavioral disinhibition: Liability for externalizing spectrum disorders and its genetic and environmental relation to response inhibition across adolescence. *Journal of Abnormal Psychology*, 118, 117–130.
- Young, S. E., Stallings, M. C., Corley, R. P., Krauter, K. S., & Hewitt, J. K. (2000). Genetic and environmental influences on behavioral disinhibition. *American Journal of Medical Genetics*, 96, 684–695.

# CHAPTER 7

# **Callous–Unemotional Traits**

# ESSI VIDING EVA R. KIMONIS

ontemporary definitions of psychopathy in adults encompass ratings of both affective J dysfunction and overt antisocial behavior. The affective dysfunction facet of psychopathy involves reduced guilt and empathy, as well as reduced attachment to significant others. In children, these features have been variously termed "callous-unemotional" (CU) traits, "psychopathic traits," and, most recently, in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association [APA], 2013), "limited prosocial emotions"; in this chapter, we use the term "CU traits" for consistency.<sup>1</sup> Cleckley (1941/1976) viewed this affective dysfunction as the "hallmark" of psychopathy, with Bowlby's (1946) subsequent description of "affectionless psychopathy" constituting the first extension of the psychopathy concept to children.

The small proportion of adult offenders displaying the affective features of psychopathy exhibit a more severe, chronic, and violent pattern of antisocial behavior than their nonpsychopathic peers (Leistico, Salekin, DeCoster, & Rogers, 2008). They also show some distinct neurological, cognitive, and emotional characteristics when compared with other antisocial adults, consistent with the possibility that different causal factors may give rise to antisocial behavior in the two groups (Blair, 2013; Frick & Marsee, Chapter 19, this volume). Findings of this kind have led researchers to focus on CU traits as a potentially informative set of characteristics for understanding the development of adult psychopathy (Frick & Ray, 2014), and indeed, when CU traits occur in combination with antisocial behavior, they are linked with severe, chronic, and proactive antisocial and violent behavior (Frick, Ray, Thornton, & Kahn, 2014b) and are prognostic of psychopathy in later life (Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007).

The reason researchers have concentrated on the study of CU traits over other symptom dimensions of psychopathy (i.e., narcissism/interpersonal and impulsivity/lifestyle features), is because of their distinct utility for differentiating a subgroup of antisocial children and adolescents who appear to differ from other antisocial youth on important biological, cognitive, emotional, and social characteristics (Frick & Marsee, Chapter 19, this volume). Put in adult psychopathy terms, it is the combination of CU traits/affective dysfunction with the impulsive–antisocial behaviors captured by the Factor 2 dimension of psychopathy that designates the most severely antisocial group of youth.

In this chapter, we first provide an overview of approaches to assessing the CU construct, as its operationalization necessarily influences research questions and participant samples targeted for study. Second, we review evidence regarding the temporal stability of CU traits. Third, we provide a brief overview of research that has investigated whether CU traits characterize an etiologically distinct subgroup of children with antisocial behavior, focusing in particular on genetic risk studies and neurocognitive and experimental work. Despite exciting advances yielded by research across these different levels of analysis, the field is still a long way from a nuanced, multilevel, developmentally informed understanding of CU traits and psychopathic behavior. Accordingly, we discuss both the promise of the extant evidence base and its limitations, and consider a number of issues relevant to the study of CU traits, longitudinally and across levels of analysis. Finally, we offer some recommendations for future research efforts in this area.

#### Assessment of CU Traits

Various methods exist for indexing the construct of callous unemotionality in youth and adults, ranging from informant rating scales to self-report scales to structured professional judgment tools (i.e., interview-based clinical rating scales). Several youth measures are direct downward extensions of the most widely used clinical rating scale for adults, the Psychopathy Checklist-Revised (PCL-R; Hare, 1991, 2003; Hare, Neumann, & Mokros, Chapter 3, this volume). The optimal method for operationalizing callous unemotionality necessarily differs by age group and setting. The subsections that follow describe instruments that have been specifically designed to index CU traits, and other instruments created to measure psychopathic traits more broadly that include coverage of CU features.<sup>2</sup>

#### Antisocial Process Screening Device

The Antisocial Process Screening Device (APSD; Frick & Hare, 2001; Muñoz & Frick, 2007) is a 20-item rating scale designed to measure CU, narcissism, and impulsivity dimensions of psychopathy in children ages 6–13 years. Informant-rating and youth self-report versions are available. The APSD was patterned after the PCL-R by adapting the PCL-R's 20 items into analogous behavioral items more applicable to children, each scored using a similar 3-point scale (0 = not at all true,1 = sometimes true, 2 = definitely true). Factoranalytic studies of the APSD's 20 items support both two-factor (impulsivity-conduct problems and CU) and three-factor (narcissism, CU, and impulsivity) structures, with the CU factor highly stable across the two models (Fite, Greening, Stoppelbein, & Fabiano, 2008; Frick, Bodin, & Barry, 2000). The CU scale of the APSD has been the most extensively researched operationalization of the CU construct. Accumulating evidence supports the construct validity of APSD scores and the CU scale in particular (for a review, see Kotler & McMahon, 2010). For example, CU scale scores correlate reliably with conduct problems, sensation seeking, fearlessness, and deficient emotional processing (e.g., Frick et al., 2000; Loney, Frick, Clements, Ellis, & Kerlin, 2003). Nonetheless, the APSD's CU scale has been criticized for its limited number of items (n = 6) and the weak internal consistency it has shown relative to narcissism and impulsivity scales in some prior studies (Muñoz & Frick, 2007; Poythress, Dembo, Wareham, & Greenbaum, 2006; Vaughn & Howard, 2005).

Some studies have utilized an expanded version of the scale that combines the APSD CU items with items taken from the Prosocial scale of the informant-rated Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). Reported internal consistencies for this expanded CU scale have ranged from poor to adequate (alphas = .45-.79; Dadds, Fraser, Frost, & Hawes, 2005; Viding, Blair, Moffitt, & Plomin, 2005). Supporting its validity, children scoring high on this expanded CU scale showed fear recognition deficits, and increased incidence of conduct problems over a 12-month period (even when analyses controlled for initial conduct problem severity), compared to children who score low (Dadds et al., 2005, 2006). This scale also distinguishes a group of children whose conduct problems are highly heritable (Viding et al., 2005; Viding, Jones, Paul, Moffitt, & Plomin, 2008).

#### Inventory of Callous–Unemotional Traits

The 24-item Inventory of Callous–Unemotional Traits (ICU; Frick, 2003; Kimonis, Frick, Skeem, et al., 2008) was developed through systematic work over two decades, and provides one of the most comprehensive measures of CU traits currently available. Items are rated on a 4-point Likert scale, from 0 (*Not at all true*) to 3 (*Definitely true*). There are five versions of the inventory: parent- and teacher-rating versions for school-age children; parent and teacher versions for preschool children; and a self-report version for school-age children, adolescents, and adults. Alphas for total ICU scores range from acceptable to good (.77– .89) across different samples (e.g., Essau, Sasagawa, & Frick, 2006; Roose, Bijttebier, Decoene, Claes, & Frick, 2010). Supporting its construct validity with individuals from preschool age to early adulthood, ICU total scores correlate with clinically important criteria, such as reduced emotional responding to distress cues and engagement in severe aggression, across samples varying in age, sex, and other characteristics, and across different language versions and/or cultural contexts (e.g., Ezpeleta, de la Osa, Granero, Penelo, & Domènech, 2013; Kimonis, Branch, Hagman, Graham & Miller, 2013; cf. Feilhauer, Cima, & Arntz, 2012). In samples of young adults, self-report ICU scores demonstrate good internal psychometric properties and expected correlations with external criteria of various types (Byrd, Kahn, & Pardini, 2013; Kimonis, Branch, et al., 2013).

Factor-analytic studies of the self-report version of the ICU in adolescent nonreferred (Fanti, Frick, & Georgiou, 2009; Roose et al., 2010) and incarcerated samples (Kimonis, Frick, Skeem, et al., 2008) support a three-factor bifactor model. This is a model in which the shared variance across all ICU items is reflected in a general CU factor, and the shared residual variances among certain subsets of items are captured by three subfactors (i.e., Uncaring, Callousness, and Unemotional) specified to be independent of one another. Across studies, the Uncaring dimension is associated with empathy deficits, and both Uncaring and Callousness dimensions are associated with antisocial behavior, conduct problems, and aggression. Whereas scores on the Uncaring scale predict general recidivism, scores on the Callousness scale predict violent recidivism among male juvenile offenders (Kimonis, Kennealy, & Goulter, 2016). The Unemotional dimension fails to demonstrate consistent or robust associations with external correlates, except sensation seeking and empathy, which has led some to suggest a need for refining how the ICU operationalizes the shallow affect dimension of CU traits (Hawes, Byrd, et al., 2014; Kimonis, Bagner, Linares, Blake, & Rodriguez, 2014). A recent twin study also suggested that although a common genetic factor contributes to all dimensions of the ICU (as rated by parents), the unemotional dimension has substantive unique genetic contribution as well (Henry, Pingault, Boivin, Rijsdijk, & Viding, 2016). It is possible that ICU items focusing on "unemotionality" are not sufficiently precise to capture atypical emotional responses related to CU features, but instead quantify behaviors that are also commonly seen in other phenotypes such as autism or depression/ anhedonia. However, it remains to be investigated whether a revised set of "unemotional" items designed specifically to index lack of emotional responsiveness in interpersonal contexts (e.g., not being moved by someone's sorrow or joy) would better capture what is central to the presentation of individuals at risk for psychopathy.

#### Youth Psychopathic Traits Inventory

The Youth Psychopathic Traits Inventory (YPI; Andershed, Gustafson, Kerr, & Stattin, 2002) is a 50-item self-report questionnaire designed to assess psychopathic traits in adolescents from the general community within the 12–18 year age range. The YPI was based on Cooke and Michie's (2001) traitoriented, three-factor model of PCL-R psychopathy, and excludes items related to criminogenic behaviors. The three higher-order dimensions of the YPI encompass 10 lower-order facet scales, each composed of five items rated on a 4-point scale. The three YPI dimensions (and their affiliated facet scales) are as follows: callous-unemotional (facets = Callousness, Unemotionality, Remorselessness); grandiose-manipulative (Dishonest Charm, Grandiosity, Lying, Manipulation); and impulsive-irresponsible (Impulsivity, Thrill Seeking, Irresponsibility). Whereas some studies have reported adequate internal consistency and acceptable test-retest reliability for items comprising the YPI CU dimension as a whole (e.g., alpha ~ .70 and intraclass correlation coefficient [ICC] = .74; Skeem & Cauffman, 2003), other studies have reported lower reliabilities (i.e., alphas ranging from .36 to .49; Dolan & Rennie, 2006; Poythress et al., 2006). The CU scale postdicts a history of person offenses and predicts future violent infractions (Poythress et al., 2006; Skeem & Cauffman, 2003). Like the self-report version of the ICU, CU scores from the YPI demonstrate acceptable internal consistency with young adults (alpha = .74), and correlate in expected ways with other measures of adult psychopathy and externalizing problems (e.g., Campbell, Doucette, & French, 2009; Neumann & Pardini, 2014).

#### **Psychopathy Checklist Measures**

The Psychopathy Checklist—Revised (PCL-R; see Hare et al., Chapter 3, this volume), and its variants developed for screening purposes (Hart, Cox, & Hare, 1995) and for youth (Forth, Kosson, & Hare, 2003) are symptom rating scales that define psychopathy multidimensionally along interpersonal, affective, and behavioral symptom clusters. The youth version (PCL:YV) is a downward extension of the PCL-R, designed for use with 12- to 18-year old adolescents within institutional settings (see Salekin, Andershed, & Clark, Chapter 20, this volume). For the most part, PCL:YV items do not differ substantively from the PCL-R, with the exception of developmental modifications to certain items (e.g., parasitic lifestyle, early behavioral problems) to reflect the experiences of younger individuals and the greater influence of family, peers, and school on their lives. PCL measures assess for Affective (CU) features using four items: lack of remorse or guilt (item 6), shallow affect (item 7), callous/lack of empathy (item 8), failure to accept responsibility for own actions (item 16) (Cooke & Michie, 2001; Hare, 2003); the limited number of items likely contributes to the poor internal consistency of this PCL subscale in some studies (Murrie et al., 2007; Skeem & Cauffman, 2003). These Affective items are not modified for adolescents, perhaps because CU features of psychopathy are more generalizable than other symptoms of psychopathy across developmental stages, manifesting similarly in adolescents and adults (Vincent, Vitacco, Grisso, & Corrado, 2003). As evidence for this, Obradović, Pardini, Long, and Loeber (2007) reported longitudinal invariance of CU traits from childhood to adolescence using a measure of interpersonal callousness (i.e., similar behavioral indices were indicative of CU at different ages).

#### Adult Measures of Callous– Unemotional Traits

The Coldheartedness scale of the Psychopathic Personality Inventory-Revised (PPI-CH; Lilienfeld & Widows, 2005; Sellbom, Lilienfeld, Fowler, & McCrary, Chapter 10, this volume) and the Meanness scale of the Triarchic Psychopathy Measure (TriPM; Drislane, Patrick, & Arsal, 2014; Patrick, 2010) purport to assess the CU dimension of psychopathy in adult samples. A handful of studies with adolescents have utilized the 56item short version of the PPI (PPI-SV; Lilienfeld & Andrews, 1996), which is highly correlated (r = .90) with the full 187-item version (e.g., Edens, Marcus, & Vaughn, 2011; Vaughn, Howard, & DeLisi, 2008). Factor analyses support both threeand four-factor models, with a carefree unemotionality factor (mapping most closely onto CU) retained across models (Vaughn, Litschge, DeLisi, Beaver, & McMillen, 2008; Vaughn, Newhill, DeLisi, Beaver, & Howard, 2008). Internal consistency of the CU score is poor to good (alpha = .57–.84) and associations with important external criteria are inconsistent. Only one study to date (Somma, Borroni, Drislane, & Fossati, 2015) has examined correlates of the TriPM scales (including Meanness) in adolescent participants, providing preliminary evidence for validity in relation to psychopathy-relevant criteria.

#### Summary

The foregoing measures constitute alternative methods for operationalizing the CU construct. Like any manifest measure, each has limitations and strengths. What they share in common is their focus on measuring those deficits in emotional responding that have variously been described across conceptualizations of psychopathy. These include a lack of empathy and guilt, callous disregard for others, and shallow affect. Some diverge from this focus by assessing less central features, such as lack of care about one's performance in the case of the APSD and ICU, failure to accept responsibility in the PCL measures, and lack of sentimentality and imaginativeness in the case of PPI measures (Benning, Patrick, Hicks, Blonigen, & Krueger, 2003, p. 347). Certain of these measures include only a few items specifically assessing CU traits, such as the PCL:YV (only four items) and the APSD (only six). Longer CU measures such as the ICU (24 items) and the YPI Affective scale (15 items) often provide more reliable assessments. The PPI-CH and TriPM Meanness scales also include a larger pool of items, but these adult measures have been studied only to a limited degree in youth. Additional systematic research is needed to clarify the nature and scope of the Affective (emotional detachment) dimension of psychopathy in the domain of self-report.

The optimal method for assessing CU traits necessarily differs across developmental level. Informant rating scales such as the APSD and ICU were designed to index psychopathic and CU traits in children, for whom interviewing strategies and self-reports are less applicable. Self-report inventories like the ICU and YPI are more economical than PCL:YV assessments in terms of training requirements and time/cost of administration, and also show advantages in terms of reliability and validity. Whereas CU features evaluated using clinical rating measures such as the PCL can be unreliable across evaluators, as they are less objective than behavioral features and thus subject to impression management and interviewer biases (Edens, Boccaccini, & Johnson, 2010; Miller, Kimonis, Otto, Kline, & Wasserman, 2012), reliabilities for self-report-based measures tend to be more uniform across studies. Moreover, as with measures of other personality traits, the validity of self-report CU measures tends to increase with age, whereas the validity of parent- and teacherrating measures tends to decrease from childhood to adolescence, as the opportunity for parents and other adults to directly observe various behaviors declines (Frick, Barry, & Kamphaus, 2010). However, there are also some distinct advantages to clinical rating inventories such as the PCL:YV. For example, inventories of this type engage the participant in deeper questioning surrounding his or her experience of emotional events and thus may vield more detailed and nuanced information.

The extent to which these alternative measures capture the same phenotypic dimension remains in question. Generally, correlations among the previously described CU assessment tools fall in the moderate (~ .5) range (e.g., Drislane et al., 2014; Kimonis, Branch, et al., 2013; Sellbom & Phillips, 2013; Venables, Hall, & Patrick, 2014), with generally lower estimates reported for the YPI CU scale (~ .2-.3; Andershed et al., 2002; Cauffman, Kimonis, Dmitrieva, & Monahan, 2009; Poythress et al., 2006). These small to moderate correlations indicate that while youth scoring high on one measure are more likely to score high on another, there is far from complete agreement across measures. To clarify the consequences of this overlap in practical terms, Cauffman and colleagues (2009) compared samples of youth identified as falling in the psychopathic range using broad psychopathy measures (i.e., PCL:YV, YPI, NEO-PRI). They found that in many cases, youth classified as psychopathic by one measure were not classified as such by others. In addition to further examining phenotypic overlap among alternative measures, future research is also needed to compare how these different operationalizations of CU traits map onto endophenotypes consistent with the CU construct. The assessment tool used to assess CU traits will no doubt have an impact on estimates of the stability of these traits across development, the focus of the next section.

### **Stability of CU Traits**

Estimates of stability of CU traits vary across developmental periods. For children, a number of studies demonstrate moderate to strong stability of CU measures across childhood and adolescence (e.g., Frick, Kimonis, Dandreaux, & Farell, 2003; Obradović et al., 2007). One prospective study reported that CU traits were relatively stable across time for school-age children, with a stability estimate of .93 (ICC) for parent-rating APSD scores, and .79 for youth self-report APSD scores across 4 years (Frick, Kimonis, et al., 2003). Although stability estimates for the sample as a whole in this study were very good, only 30% of the children rated high in CU traits on the first assessment remained high at all three subsequent assessment points, whereas 59% of youth rated low on CU traits at the first assessment remained low across all three subsequent points. Similarly, Fontaine, Rijsdijk, McCrory, and Viding (2010) found that over 25% of their population-based twin sample showed marked change in CU traits across development. Using longitudinal statistical modeling, they identified multiple developmental pathways from CU traits in middle childhood to adolescence, including a subsample of 3.4% showing stable high CU traits across 5 years, most of whom (80%) were boys. This group was distinguished from other trajectory groups by having the greatest level of conduct problems and hyperactivity at preschool age and early adolescence, occurring within chaotic early childhood home environments where parents used more negative disciplinary strategies.

CU traits appear somewhat less stable during adolescence. In a study of juvenile offenders, Lee, Klaver, Hart, Moretti, and Douglas (2009) examined the stability of scores on both the self-report version of the APSD and the PCL:YV after 6 months, with raters for the follow-up PCL:YV assessment instructed to rate items based on the past 6 months only. Stability was moderate to high for total scores on each instrument. However, deeper examination of the change in PCL:YV scores indicated that only 34% of young offenders showed stable scores across the 6 months-and a remarkable 50% showed a substantial decrease in scores over 6 months. The decrease was most common among younger adolescents in the sample, and the CU traits factor was the least stable. Several factors might explain why some youth remit from high levels of CU traits across time-including exposure to less harsh and negative parenting and more consistent, warm, involved positive parenting; genetically driven brain maturational factors; and potential advantages of higher socioeconomic status (SES), such as increased family access to resources and lower parental stress levels (Fontaine et al., 2010; Pardini, Lochman, & Powell, 2007; Waller, Gardner, & Hyde, 2013).

Psychopathic traits are moderately stable from childhood or adolescence into adulthood. Parent and teacher ratings of Interpersonal Callousness in children ages 7-12 predict psychopathy ratings in the same youth at ages 18-19 (Burke, Loeber, & Lahey, 2007). Longitudinal studies examining measurement invariance across time in measures of CU or psychopathic features indicate that they assess the same construct in a similar way over a 6-year period from late adolescence to young adulthood (Loney, Taylor, Butler, & Iacono, 2007). A long-term follow-up study measuring psychopathic traits at age 13 and again at age 24 demonstrated moderate stability of score levels (r = .32), despite use of different informants and assessment instruments across the two age periods (Lynam et al., 2007). Although only a minority of those who scored in the top 20% at age 13 went on to attain an adult diagnosis of psychopathy (PCL:SV), and the vast majority (86%) did not, the 11-year correlation in this study was highly similar to that typically seen when different informants use the same instrument to assess for psychopathy at the same time point. The fact that 14% continued to score high as adults indicates higher stability for CU traits than for other youth disorders. It will be interesting for future researchers to examine stability estimates using comprehensive CU measures such as the APSD, ICU, and YPI that have been validated in both youth and adult samples. More studies are needed to determine whether different measures assess the same underlying construct over time, and which measures are most effective for capturing stability versus change in CU scores.

#### Summary

On the surface, the few studies that have examined the stability of psychopathic traits by administering measures at different times indicate moderate to high stability based on ICCs. Stability estimates differ somewhat depending on the method used, with estimates generally higher for the PCL:YV and parent-rating measures of psychopathy than for self-report measures. However, deeper examination indicates that most of the general stability (around 30%) during particular developmental stages (childhood or adolescence) comes from the subset of youth who start out scoring low in psychopathic features. The study by Lynam and colleagues (2007) indicates that scores may be stable for an even smaller proportion of youth (14%) when extending into young adulthood. These findings are not surprising given the general instability of most forms of childhood psychopathology (Mash & Dozois, 2003). Childhood disorders can arise early in life and remit altogether as a result of developmental processes (Cicchetti & Cohen, 1995). Moreover, children may express symptoms indicative of psychopathology at some point in their development due to normal variations in functioning (Cicchetti & Rogosch, 1996). The reliability of symptom assessments with young people is further complicated by heterotypic continuity, which means that symptoms rarely manifest in the same manner across time (Cicchetti & Cohen, 1995; Cicchetti & Rogosch, 1996).

In the next section, we turn our attention to genetic, neurocognitive, and psychobiological/ temperamental vulnerabilities that are thought to underlie the development of CU traits and that distinguish individuals with conduct problems who show high levels of CU traits from those who exhibit lower levels of CU traits. We also briefly discuss factors that may affect the expression of biological vulnerability to CU traits, such as parenting or socioeconomic resources.

## Vulnerabilities Relevant to the Development of CU Traits

#### Genetic Factors

Individual differences in CU are estimated to be moderately to strongly heritable using the standard twin design, which compares resemblance in monozygotic (MZ) and dizygotic (DZ) twins in community samples of children and adolescents (range of heritability estimates = .45-.67; see Viding & McCrory, 2012). Having elevated levels of CU appears strongly heritable in childhood regardless of whether CU traits are accompanied by conduct problems (Larsson, Viding, Rijsdijk, & Plomin, 2008). It is also of interest to note that conduct problems accompanied by high levels of CU traits appear strongly heritable, whereas conduct problems accompanied by low levels of CU traits appear to be more strongly influenced by environmental factors (Viding et al., 2005, 2008).

Twin studies suggest that there is considerable overlap in the genes that influence CU traits and conduct/externalizing problems, but that there are also unique genetic influences on CU (Bezdjian, Raine, Baker, & Lynam, 2011; Forsman, Lichtenstein, Andershed, & Larsson, 2008; Viding, Frick, & Plomin, 2007). This finding is consistent with evidence indicating that high levels of CU can occur in the absence of clinical levels of conduct problems (Frick, Cornell, Barry, Bodin, & Dane, 2003; Kumsta, Sonuga-Barke, & Rutter, 2012). Twin research findings also suggest that observed stability in CU/psychopathic traits is largely driven by genetic influences (Fontaine et al., 2010; Forsman et al., 2008).

Only a handful of candidate gene-association studies to date have focused on CU in children or adolescents, and these studies have tentatively implicated variants of genes related to the serotonin and oxytocin systems (e.g., Beichtman et al., 2012; Dadds, Moul, Cauchi, Hawes, & Brennan, 2013; Fowler et al., 2009; Malik, Zai, Abu, Nowrouzi, & Beitchman, 2012; Moul, Dobson-Stone, Brennan, Hawes, & Dadds, 2013). Findings from these candidate gene studies need to be reexamined in larger samples to evaluate whether they reflect true replicable associations; however, selecting candidate genes is not straightforward and can lead to unadjusted multiple testing. Because genetic risk may in many cases only "penetrate" in the presence of environmental risk, genetic studies should carefully document the environmental risk factors in their samples to increase interpretability of the findings, and thereby enhance our understanding of how genetic risk translates to disorder outcomes. For example, one interesting study reported that the long allele of a serotonin transporter polymorphism, found to be related to low amygdala reactivity in prior research, was associated with elevated CU traits in two independent community samples of adolescents (rural and urban) from low SES backgrounds (Sadeh et al., 2010). These findings suggest that genetic vulnerability to CU traits may only express under unfavorable environmental conditions.

The previously noted association studies only considered a limited number of candidate genes. However, a growing number of genomewide association studies (GWAS) are appearing; these studies systematically scan the genome with hundreds of thousands of DNA markers, made possible by DNA arrays. GWAS for psychiatric phenotypes have shown that genomewide "hits" are often in genes not previously hypothesized to influence the phenotype, or in aspects of the genome other than genes themselves (e.g., gene methylation patterns; Visscher, Brown, McCarthy, & Yang, 2012). GWAS focusing specifically on CU traits suggest that much larger samples will be needed to detect novel associations that account for far less than 1% of the variance (Viding et al., 2010, 2013). Furthermore, a genomewide complex trait analysis study suggests that most of the genetic variance that is important for explaining genetically driven individual differences in CU traits is not due to the additive effects of common genetic variants (Trzaskowski, Dale, & Plomin, 2013). This means that the search for genetic influences on CU traits is likely to be complicated by the presence of genegene interactions and rare variants, as well as geneenvironment interplay. As such, it is questionable how reliable the associations found for individual candidate genes will prove to be. Methods to identify gene-gene and gene-environment interactions are required, as is whole-genome sequencing to detect rare variants that might contribute to CU heritability, but which would not be detected by candidate gene or GWAS methods. Genetic research, including studies using novel epigenetic approaches that may help uncover mechanisms of gene-environment interplay, is likely to progress greatly in the coming decade. Two recent epigenetic studies have found that higher CU traits are associated with greater methylation of the oxytocin receptor gene (Cecil et al., 2014; Dadds et al., 2014), although it remains unclear whether this methylation pattern indexes environmentally or genetically driven epigenetic processes.

In interpreting findings from extant and future genetic/epigenetic studies, it is of critical importance to keep in mind that there are no genes for CU traits. Genes code for proteins that influence characteristics such as neurocognitive vulnerabilities, which may in turn increase risk for developing CU traits. Genetic variants that are implicated as risk genes for CU traits are likely to include several genes that confer advantages, as well as disadvantages, depending on the environmental context. The neurocognitive vulnerabilities associated with CU traits are at least partially distinct from those associated with conduct problems more broadly (see "Neurocognitive Factors" section). This suggests that the risk alleles for CU traits, or conduct problems that co-occur with CU traits, may not always be the same as risk alleles for conduct problems in the absence of CU traits.

#### **Neurocognitive Factors**

Behaviorally, children with CU traits show a marked lack of empathy or guilt. They often engage in proactive, instrumental aggression, seem impervious to sanctions, and do not appear to exhibit the affiliative needs and goals that characterize typical children (Frick & Viding, 2009). Given this profile, many of the experimental studies on children with CU traits have focused on how they process emotions, whether they empathize with others, and whether they change their behavior following punishment. These studies have documented that, compared with typically developing children or children with other psychopathologies, children with CU traits are less likely to attend to, react to, and recognize affective stimuli, particularly distress cues such as fearful and sad expressions of other people (e.g., Hodsoll, Lavie, & Viding, 2014; Kimonis, Frick, Muñoz, & Aucoin, 2008; Marsh & Blair, 2008; Sylvers, Brennan, & Lilienfeld, 2011; but see Dadds, El Masry, Wimalaweera, & Guastella, 2008, for evidence that fear recognition can be normalized in these children by directing their gaze to the eye region of face stimuli); show blunted empathy towards others (e.g., Jones, Happé, Gilbert, Burnett, & Viding, 2010; Schwenck et al., 2012; de Wied, Van Boxtel, Matthys, & Meeus, 2012); do not direct attention to the eyes of attachment figures (e.g., Dadds, Jambrak, Pasalich, Hawes, & Brennan, 2011; Dadds, Allen, et al., 2012); and are slower to alter their behavior following punishment (e.g., Blair, Colledge, Murray, & Mitchell, 2001).

The experimental findings that indicate atypical emotion processing and reduced attention to emotional stimuli have prompted the study of functional neural correlates of CU traits (and conduct problems accompanied by CU traits) in children, with a particular focus on brain areas associated with emotional, reward, and empathic processing. In line with the behavioral and experimental neuropsychology data, functional magnetic resonance imaging (fMRI) findings for children exhibiting conduct problems with CU traits indicate brain reactivity deficits consistent with low emotional responsiveness to others' distress and poor ability to learn from reinforcement information. In particular, studies have reported reduced amygdala activity in response to fearful faces in children exhibiting conduct problems with high levels of CU traits relative to typically developing children, children with attention-deficit/hyperactivity disorder (ADHD), and children exhibiting conduct problems without CU traits (Jones, Riley, Williamson, & Whitehead, 2009; Marsh et al., 2008; Viding et al., 2012). A recent study also reported that the association between CU traits and proactive aggression is partially mediated by low amygdala reactivity to fearful faces (Lozier, Cardinale, VanMeter, & Marsh, 2014).

In addition, two fMRI studies that used attention-to-emotion paradigms have found atypical amygdala activation in response to fear stimuli under low attentional load conditions, wherein fear stimuli typically elicit amygdala activation in healthy volunteers (White, Marsh, et al., 2012). Furthermore, attentional cueing by eye gaze of a fearful face does not seem to elicit activation in the dorsal frontoparietal endogenous attentionorienting network in children with conduct problems and high CU traits, although this network is reliably activated in typically developing children under such conditions (White, Williams, et al., 2012).

Reduced amygdala activity in children with conduct problems and high CU traits also seems to extend to more complex forms of social judgment regarding other people's distress, such as categorization of legal and illegal behaviors in a moral judgment task (Marsh et al., 2011) or making decisions about appropriate responses to the distress of others (Sebastian et al., 2012). Interestingly, conduct problems with low levels of CU traits appear to be associated with exaggerated rather than reduced amygdala activity in response to emotional facial expressions (Sebastian et al., 2012; Viding et al., 2012), in line with findings from studies that have used self-report (e.g., Pardini, Lochman, & Frick, 2003) and laboratory emotion tasks (e.g., Kimonis, Frick, Fazekas, & Loney, 2006; Kimonis, Frick, Muñoz, et al., 2008). However, the exaggerated neural reactivity may not extend to more generic affective stimuli in youth with conduct problems and low CU traits (Hwang et al., 2016).

Five recent studies of children exhibiting conduct problems and varying levels of CU traits (four involving fMRI, and one involving measurement of brain event-related potentials) have reported atypical neural reactivity to other people's pain (Cheng, Hung, & Decety, 2012; Lockwood et al., 2013; Marsh et al., 2013; Michalska, Zeffiro, & Decety, 2016; Yoder, Lahey, & Decety, 2016). Collectively, these studies implicate reduced activity and altered connectivity in a network of brain areas shown to be associated with empathy for other people's pain in prior research with healthy individuals (e.g., the anterior insula, posterior insula, anterior cingulate cortex, and amygdala) for children with conduct problems and high levels of CU traits. Interestingly, this profile of reduced neural reactivity to expressions of pain is not coupled with difficulty in understanding intentionality on the part of others (Cheng et al., 2012).

Cohn and colleagues (2013) studied fear conditioning in boys with early offending histories and reported that CU traits were negatively associated with anterior cingulate cortex activity during fear conditioning. Abnormal ventromedial prefrontal cortex (vmPFC) and orbitofrontal cortex (OFC) response to punishment and reward in children with conduct problems and CU traits have also been reported (Finger et al., 2008, 2011). For example, Finger and colleagues (2008) reported that both typically developing children and children with ADHD showed a reduction in vmPFC activity following an unexpected punishment. Such reduction in vmPFC activity has been shown to co-occur with prediction error, that is, when an actual outcome differs from the expected outcome (Mitchell, 2011). In contrast, youth with conduct problems and CU traits did not show this reduction in vmPFC activity. In another study that used a passive avoidance task in which participants had to learn which stimuli were "good" (rewarded) and which were "bad" (unrewarded), Finger and colleagues (2011) found that children with conduct problems and CU traits showed less OFC and caudate responsiveness to early stimulus reinforcement exposure, and less OFC responsiveness to rewards. These neural differences can be interpreted as reflecting compromised sensitivity to early reinforcement information in the OFC and caudate, and compromised sensitivity to reward outcome information in the OFC, in adolescents with conduct problems and CU traits. More recent work, however, suggests that the difficulties in reinforcement learning may not be unique to conduct problems with CU traits but may instead be a common problem among children with conduct problems as a whole (White et al., 2013, 2014).

The fMRI findings in children with conduct problems and CU traits are largely in line with those typically reported in studies of psychopathic adults (e.g., Birbaumer et al., 2005; Kiehl et al., 2001; for a review, see Seara-Cardoso & Viding, 2014) and suggest functional neural bases for why these children appear unaffected by other people's distress and often make and repeat disadvantageous decisions. In turn, these reported fMRI effects for children exhibiting conduct problems along with CU traits may represent neural indicators of vulnerability that render these children at increased risk for developing adult psychopathy.

#### **Hormonal Factors**

Some studies have reported atypical cortisol levels in individuals with CU traits, but inconsistencies are evident in this literature (Hawes, Brennan, & Dadds, 2009). For example, while some studies report low cortisol levels among individuals with high psychopathic/CU traits (Cima, Smeets, & Jelicic, 2008; Loney, Butler, Lima, Counts, & Eckel, 2006; Stadler et al., 2011), other studies fail to find an association (Holi, Auvinen-Lintunen, Lindberg, Tani, & Virkkunen, 2006; Poustka et al., 2010). Cortisol alone may be a poor biomarker of CU traits, and examining instead the interaction of stress and sex hormones may contribute more to clarifying the role of neuroendocrine factors in psychopathy (Glenn, Raine, Schug, Gao, & Granger, 2011). For example, Johnson and colleagues (2014) found that high interpersonal traits of psychopathy among juvenile offenders were associated with tighter coupling of cortisol with dehydroepiandrosterone (DHEA) throughout the day, which means that hormone levels fluctuated together. DHEA is the most abundant human steroid and serves a protective function by buffering the neurotoxic effects of prolonged cortisol exposure on the hippocampus and hypothalamic-pituitary-adrenal (HPA) axis. Although CU traits were unrelated to coupling in this study, recent findings suggest the cortisol-to-DHEA ratio may differ as a function of anxiety levels among boys with high CU (Kimonis, Goulter, Hawes, Wilbur, & Groer, 2017).

#### **Physiological Factors**

Both reduced skin conductance reactivity and reduced heart rate in response to other people's distress have been reported in children with conduct problems and CU traits, when compared with typically developing peers and peers with conduct problems only (Anastassiou-Hadjicharalambous & Warden, 2008; Blair, 1999; de Wied et al., 2012). In addition, reduced skin conductance reactivity in children/youth with high levels of CU traits has been reported for distress emotions (Blair, 1999), when children/youth anticipate aversive stimuli (Fung et al., 2005; Isen et al., 2010) and when they respond to peer provocation (Kimonis, Frick, Muñoz, et al., 2008). However, it appears that resting heart rate does not differentiate children with CU traits (de Wied et al., 2012).

#### Early Temperamental Factors

Developmental models propose that an early temperament characterized by reduced emotional responsiveness to negative emotional cues and events plays a role in the emergence of CU traits (Frick, Ray, Thornton, & Kahn, 2014a). Fearlessness and low fear-related arousal have been consistently linked to antisocial outcomes in longitudinal studies (e.g., Loeber & Pardini, 2008). Infants and children who display fearless temperament and lack of fearful arousal are also known to show atypical development of empathy and guilt (Fowles & Kochanska, 2000). In line with this, Barker, Oliver, Viding, Salekin, and Maughan (2011) found that fearless temperament at age 2 predicted CU traits at age 13, even after they controlled for variables such as parenting. Thus, fearlessness appears to be an early temperamental factor that predicts development of CU traits in adolescence (but see work by Mills-Koonce et al. [2015], suggesting that, for a subset of children, later CU traits may be preceded by exaggerated fear responses to highly salient stimuli during early development).

#### Factors Influencing the Expression and Developmental Course of CU Traits

Although an individual's genome likely limits a "range for phenotypic expression," it does not prespecify how an individual will turn out. The specific developmental trajectory of any individual is determined by a complex interplay between genetic propensities and other factors that constrain how those genetic propensities are expressed at several different levels of analysis. It is also likely that an individual's genetic predisposition influences the types of environments the individual is likely to encounter—for example, via the kinds of reactions that the individual evokes in those around him or her.

Harsh and negative parenting has been associated with higher levels of CU traits, while a warm parental style has been associated with lower levels of CU traits in children (for a review, see Waller et al., 2013). However, to date, only two genetically informative longitudinal studies have investigated parenting and development of CU traits (Hyde et al., 2016; Viding, Fontaine, Oliver, & Plomin, 2009). Results from the first of these studies, capitalizing on an MZ-twin differences design, suggest that the association between harsh and negative parenting and higher levels of CU traits in children may, at least in part, reflect genetic vulnerability within families (Viding et al., 2009). This could either reflect a shared genetic vulnerability for poor parenting and CU temperament, or an effect of CU temperament in evoking negative/ harsh parenting. Complementing this work, a very recent adoption study found that antisocial behavior on the part of biological mothers predicted early CU behaviors in toddlers, but, interestingly, high levels of adoptive mothers' positive reinforcement were able to buffer the effects of heritable risk for CU behaviors (Hyde et al., 2016). These findings are extremely encouraging, although it is important to bear in mind that parents in adoptive families are typically very motivated to undertake the challenges of parenting and are also often well resourced. By contrast, in biological families, parents of children with CU traits are likely to have a host of genetic and contextual risk factors that can pose challenges for promoting interventions that seek to increase positive reinforcement behaviors toward the child—particularly if that child is challenging.

A few studies to date have also reported an association between CU traits and disorganized attachment (Bohlin, Eninger, Brocki, & Thorell, 2012; Pasalich, Dadds, Hawes, & Brennan, 2011). However, no genetically-informative longitudinal studies exist that could elucidate the degree to which CU tendencies may drive the development of disorganized attachment. Data from Dadds and colleagues (2011; Dadds, Allen, et al., 2012; 2014) suggest that compared with other children, those with high levels of CU traits make less eye contact with their mothers in both free play and directed situations. The mothers of children with high levels of CU traits, on the other hand, do not differ from mothers of other children in the amount of eye contact they attempt with their children. This suggests that children with high CU traits bring a number of challenges to the parenting dynamic, which may operate to affect the formation of attachment style.

A number of other factors, apart from parenting and parental attachment, may also contribute to the development of CU traits and warrant mention. These include peer relationships, SES, cognitive ability, and pre- and perinatal risk factors. Peer relationships of children with high levels of CU traits are characterized by less stability and greater conflict (Muñoz, Kerr, & Besic, 2008). Children with high levels of CU traits have also been reported to associate more frequently with delinquent friends (Kimonis, Frick, & Barry, 2004), but interestingly seem to be less influenced by their friends' peer delinquency (Kerr, Van Zalk, & Stattin, 2012). Instead, their delinquent behavior appears to strongly influence their friends (Kerr et al., 2012). Research by Sadeh and colleagues (2010) suggests that low-SES/limited-resource neighbourhoods are associated with higher CU traits, but this association may only hold for those individuals who carry the long allele of the serotonin transporter polymorphism.

Regarding cognitive ability, a handful of studies point to a modest negative association between CU traits and IQ (e.g., Fontaine, Barker, Salekin, & Viding, 2008), but the mechanisms of this association are currently unclear. Behavioral problems commonly associated with CU traits may limit educational opportunities of children and contribute to this association. A lack of concern over performance (indicative of CU on the APSD and ICU) is also likely to negatively impact standardized IQ scores. With regard to pre-and perinatal risk factors, one study reported an association between CU traits (either with or without conduct problems) and maternal psychopathology during and after pregnancy (Barker et al., 2011). However, no data yet exist regarding the role of risk factors such as head injury or infection. This is clearly an area that merits further investigation, and in pursuing work along this line, it is critical that researchers utilize designs that permit evaluation of whether the pre- and perinatal risk factors play a causal role in the development of CU, or merely reflect genetic vulnerability within families of children exhibiting CU traits.

#### Summary

The current evidence base indicates that both genetic and environmental risk factors contribute to the development of CU traits. We are at present some way away from conclusively identifying risk genes for the development of CU traits, but the extant data suggest that finding them will be complicated by the presence of gene–gene interactions, as well as rare genetic variants. Genetically informative studies indicate that although family environmental factors that are associated with CU traits may in part reflect genetic endowment within families, there is also clear scope for positive environmental factors—such as warm and positive parenting—to ameliorate the development of CU traits.

The majority of studies investigating neurocognitive, hormonal, psychophysiological, and temperamental correlates of CU traits suggest that children with high levels of such traits display atypically blunted emotional/stress reactivity. However, longitudinal investigations including data for these levels of analyses are either scarce or absent, and we currently do not know very much about how the child's predisposition (variously quantified) contributes to the parent–child or child–peer dynamic over time.

In the following section, we overview the potential treatment implications stemming from the current evidence base on CU traits.

#### **Treatment Implications**

Stability estimates and developmental trajectory analyses indicate that CU traits in youth are changeable rather than fixed (e.g., Burke et al., 2007; Fontaine et al., 2010). A potentially critical factor leading to change in CU traits and related antisocial behaviors over time for children with CU traits is parental warmth and involvement (see Hyde et al., 2016; Waller et al., 2013). This type of parenting style is thought to promote attachment security and to be critical to fostering conscience development in temperamentally fearless children (Kochanska, 1997).

Studies on community samples document "what is," whereas intervention studies document "what can be." Encouragingly, from a clinical perspective, for those youth who show stable high CU traits across time (representing ~ 30% of those with high-CU), intensive and comprehensive interventions tailored to their unique emotional, cognitive, and motivational needs can contribute to reductions in conduct problems over time (Hawes, Price, & Dadds, 2014; Waller et al., 2013). For example, among children referred for treatment of conduct problems, those with high teacher-rated APSD CU scores showed a similar degree of improvement in response to a multimodal intervention as those with low CU scores (Kolko & Pardini, 2010; see also Caldwell, Skeem, Salekin, & Van Rybroek, 2006). Parent training interventions delivered in early childhood have also been shown to produce lasting reductions in CU traits (see Hawes, Price, & Dadds, 2014).

It may be especially beneficial to target those areas of difficulty that are unique to individuals with CU traits. For example, reward-based techniques that capitalize on the reward-dominant response styles of youth with CU traits appear more effective than punishment in reducing their antisocial behaviors (Hawes & Dadds, 2005; Hawes, Dadds, Brennan, Rhodes, & Cauchi, 2013). More broadly, traditional treatment approaches are unlikely to be effective for addressing distinct emotional deficiencies at the core of CU traits. As research on neurocognitive risk factors and developmental mechanisms for CU progresses, findings from this work may provide additional clues as to how to improve existing interventions or design novel targeted treatments for youth with CU traits. For example, supplementing parent training with emotional recognition training has been found to change observer ratings of children's affective empathy and externalizing problems compared to parent training alone among 6- to 16-year-old antisocial boys with elevated CU traits (Dadds, Cauchi, Wimalaweera, Hawes, & Brennan, 2012). These findings highlight the promising potential of adjunctive interventions addressing emotional deficiencies unique to antisocial children with CU traits, but currently the mechanisms by which the change in child behavior occurs are unclear.

## General Discussion and Future Research Needs

#### Refining Assessment of CU Traits

Research studies across many years have refined the measurement of the affective dysfunction dimension of psychopathy in youth, but additional research is needed within the domain of clinical interview assessment and in at least three other key areas. First, better estimates of the long-term stability of CU traits are needed, based on longitudinal research using the same comprehensive measure from childhood to adulthood. The ICU appears to be a good candidate for use in work of this kind, as it provides one of the most comprehensive operational definitions of CU traits currently available, and scores on the ICU have proven reliable and valid in preschoolers through to young adults (Ezpeleta et al., 2013; Kimonis, Branch, et al., 2013; Kimonis et al., 2015; Kimonis, Fanti, Anastassiou-Hadjicharalambous, et al., 2016). Second, research should be directed toward refining the assessment of the shallow affect facet of CU. In particular, as noted earlier, the Unemotional scale of the ICU consistently has shown low to null correlations with criterion measures across studies with a variety of populations (e.g., Kimonis, Branch, et al., 2013). These low correlations may be attributable to the lower internal consistency of this scale or to its focus on restricted emotional expression rather than displays of affect for the purpose of attaining desired goals or manipulating others (e.g., as recognized in the criteria for the "limited prosocial emotions" specifier in DSM-5; Frick & Moffitt, 2010). Genetically informative research also indicates that the Unemotional scale of the ICU may be capturing aspects of "unemotionality" that are not unique to those with CU trait presentation (Henry et al., 2016). By contrast, the callousness facet of the YPI Callous-Unemotional scale is represented by items tapping (1) emotional impassibility, entailing reduced experience of fear and sadness, and (2) emotional insensitivity, entailing reduced emotional contagion and a perception of emotions as showing weakness; items of these types may better capture shallow affect. Preliminary research suggests that a multimethod approach supplementing CU rating measures with laboratory measures of emotional processing may optimize the prediction of external criteria (Kimonis, Frick, Muñoz, & Aucoin, 2007; Muñoz, 2009), but more studies are needed to further evaluate and refine multimethod assessment approaches.

A growing body of research documents a variety of risk indicators for the development of CU traits (or conduct problems that occur with these traits)—spanning genetic, neurocognitive, neuroendocrine, physiological, temperamental, and family variables. In light of this work, a third major direction for future measurement research is to evaluate whether the next generation of comprehensive CU tools (e.g., deriving from research as recommended earlier) shows stronger associations with these risk indicators than currently available measures.

#### Advancing Knowledge of Etiology

Existing data indicate that children with CU traits have a genetic vulnerability, but little is known about specific contributing genes or how the genetic vulnerability interacts with other factors to increase the risk of developing atypical neurocognitive, hormonal, psychophysiological, and temperamental profiles. In order to advance our understanding of developmental pathways to CU traits and concomitant behavioral problems, longitudinal as well as genetically informative studies with multiple measures of risk are needed to understand how these factors interact with one other and whether they are truly causal for the development of CU traits.

The field also needs to investigate heterogeneity in the causal processes that may lead to the development of CU traits. An atypical profile in which CU traits co-occur with anxiety is more likely to be associated with social and environmental adversity than CU traits that present without anxiety (e.g., Kimonis, Frick, Cauffman, Goldweber, & Skeem, 2012; Kimonis, Skeem, Cauffman, & Dmitrieva, 2011). Currently, we do not know the degree to which children exposed to adversity who present with CU and comorbid anxiety share genetic, neurocognitive, hormonal, and psychophysiological characteristics with children who exhibit CU traits without anxiety—although emerging research suggests that they may look more like maltreated and anxious children in general (i.e., showing overreactivity to affective stimuli rather than the underreactivity that is typical for nonanxious children with high CU; Kimonis, Fanti, Goulter & Hall, 2017; Kimonis et al., 2012). It is plausible that either biologically or environmentally "weighted" pathways to CU behavioral presentation may exist, even if one pathway is considerably more common than the other, or even if the two pathways differ at the level of pathophysiology. A recent epigenetic study suggests that this might be the case (Cecil et al., 2014), but future research efforts are needed in this area.

Additionally, more research is needed on the subset of children who show high levels of CU traits but nonclinical levels of conduct problems (see, e.g., Barker et al., 2011; Fanti, 2013; Kumsta et al., 2012; Rowe, Costello, Angold, Copeland, & Maughan, 2010). Generally, preliminary studies support the notion that these children have a greater presence of protective factors and an absence of negative risk factors relative to children with CU traits and conduct problems. For example, youth high on CU traits without conduct problems were differentiated from those with conduct problems by showing better executive control and lower impulsivity, being exposed to more warm and positive parenting, and being more connected to school, suggestive of potential protective factors against antisocial behavior among youth who lack developmentally appropriate levels of guilt and empathy (Fanti, Kimonis, Hadjicharalambous, & Steinberg, 2016; Wall, Frick, Fanti, & Kimonis, 2016). Currently, little is known about the neurocognitive correlates of affective processing and the long-term prognosis of these children. Extant studies suggest that children with CU traits and nonclinical levels of conduct problems nonetheless often present with elevated levels of disruptive behaviors and other psychological problems.

A potentially fruitful avenue of research could also be to focus on core biobehavioral processes that appear likely to increase the risk for developing CU traits. The National Institute of Mental Health's Research Domain Criteria (RDoC) framework (www.nimh.nih.gov/research-priorities/rdoc/ nimh-research-domain-criteria-rdoc.shtml) includes several process constructs, organized within broad biobehavioral domains, that appear relevant, such as the constructs of acute threat (fear processing) and frustrative nonreward in the Negative Valence Systems domain. Currently, we have scarce data on the longitudinal development of these basic biobehavioral processes as indexed using different methods. We also do not know the degree to which they account for variability in CU trait levels across individuals at later stages of development.

#### **Optimizing Treatment Methods**

It is encouraging that antisocial children with CU traits appear to benefit from certain treatments despite their severe, chronic, and proactive antisocial and violent behavior. The challenge over the next 10 years is to more comprehensively delineate what precisely works for these children and how current intervention and prevention programs can be optimized in ways that improve engagement, as well as clinical outcomes, such as by providing children with adjunctive emotional skills training (Datyner, Kimonis, Hunt, & Armstrong, 2016). As a basis for refining therapeutic approaches, further research is needed to determine the degree to which impairments of children with high CU in processing of affective information are malleable. Also important will be investigations focusing on possible compensatory cognitive-affective functions that can be harnessed to offset atypical information processing. There is every reason to be optimistic about prospects for improvement, but effective collaborations between basic science and clinical researchers will be essential to making genuine progress along these important lines.

#### NOTES

- "Interpersonal callousness" is a related construct representing the combination of affective and interpersonal features (e.g., lack of guilt, glibness) that comprise Factor 1 of psychopathy; it has been operationalized using an informant rating scale consisting of items from the Teacher Report Form (Achenbach & Edelbrock, 1986) of the Child Behavior Checklist (Achenbach, 1991), along with supplemental items available in the dataset for this project. The primary focus of this chapter is on CU traits, but research using the "interpersonal callousness" operationalization is also covered.
- 2. Some broader rating scales composed of items from assessment instruments originally designed for other purposes (e.g., general personality inventories, psychiatric symptoms) have also been used to index psychopathic traits in children, but it is beyond the scope of this chapter to review them in detail. These include the Modified Childhood Psychopathy Scale (mCPS; Lynam, 1997), an informant rating scale and a self-report inventory derived from the Child Behavior Checklist (Achenbach, 1991) and the Common Language Version of the California Child

Q-Set (Block & Block, 1980); the Psychopathy Content Scale–59 (PCS-59; Murrie & Cornell, 2000), a self-report tool derived from the Millon Adolescent Clinical Inventory (MACI; Millon, 1993); the Psychopathy Scale–16 and –11 (PS-16 and PS-11; Rogers, Vitacco, Cruise, Sewell, & Neumann, 2002); and tools derived from the NEO Personality Inventory—Revised (NEO-PI-R; Costa & McCrae, 1992), including the self-report NEO Psychopathy Resemblance Index (NEO PRI; Lynam & Widiger, 2007).

#### REFERENCES

- Achenbach, T. M. (1991). Child Behavior Checklist/4–18. Burlington: University of Vermont, Department of Psychiatry.
- Achenbach, T. M., & Edelbrock, C. S. (1986). Manual for the Teacher's Report Form and Teacher Version of the Child Behavior Profile. Burlington: University of Vermont, Department of Psychiatry.
- Anastassiou-Hadjicharalambous, X., & Warden, D. (2008). Physiologically-indexed and self-perceived affective empathy in conduct-disordered children high and low on callous–unemotional traits. *Child Psychiatry and Human Development*, 39(4), 503–517.
- Andershed, H., Gustafson, S. B., Kerr, M., & Stattin, H. (2002). The usefulness of self-reported psychopathylike traits in the study of antisocial behaviour among non-referred adolescents. *European Journal of Personality*, 16(5), 383–402.
- Barker, E. D., Oliver, B. R., Viding, E., Salekin, R. T., & Maughan, B. (2011). The impact of prenatal maternal risk, fearless temperament and early parenting on adolescent callous–unemotional traits: A 14-year longitudinal investigation. *Journal of Child Psychol*ogy and Psychiatry, 52(8), 878–888.
- Beitchman, J. H., Zai, C. C., Muir, K., Berall, L., Nowrouzi, B., Choi, E., et al. (2012). Childhood aggression, callous–unemotional traits and oxytocin genes. *European Child and Adolescent Psychiatry*, 21(3), 125–132.
- Benning, S. D., Patrick, C. J., Hicks, B. M., Blonigen, D. M., & Krueger, R. F. (2003). Factor structure of the psychopathic personality inventory: Validity and implications for clinical assessment. *Psychological As*sessment, 15(3), 340–350.
- Bezdjian, S., Raine, A., Baker, L. A., & Lynam, D. R. (2011). Psychopathic personality in children: genetic and environmental contributions. *Psychological Medicine*, 41(3), 589–600.
- Birbaumer, N., Veit, R., Lotze, M., Erb, M., Hermann, C., Grodd, W., et al. (2005). Deficient fear conditioning in psychopathy: A functional magnetic resonance imaging study. Archives of General Psychiatry, 62(7), 799–805.
- Blair, R. J. R. (1999). Responsiveness to distress cues in the child with psychopathic tendencies. *Personality* and Individual Differences, 27(1), 135–145.

- Blair, R. J. R. (2013). The neurobiology of psychopathic traits in youths. *Nature Reviews Neuroscience*, 14(11), 786–799.
- Blair, R. J. R., Colledge, E., Murray, L., & Mitchell, D. G. V. (2001). A selective impairment in the processing of sad and fearful expressions in children with psychopathic tendencies. *Journal of Abnormal Child Psychology*, 29(6), 491–498.
- Block, J., & Block, J. H. (1980). The California Child Q-Set. Palo Alto, CA: Consulting Psychologists Press.
- Bohlin, G., Eninger, L., Brocki, K. C., & Thorell, L. B. (2012). Disorganized attachment and inhibitory capacity: Predicting externalizing problem behaviors. *Journal of Abnormal Child Psychology*, 40(3), 449–458.
- Bowlby, J. (1946). Forty-four juvenile thieves: Their characters and home-life. Journal of Abnormal and Social Psychology, 43, 61–63.
- Burke, J. D., Loeber, R., & Lahey, B. B. (2007). Adolescent conduct disorder and interpersonal callousness as predictors of psychopathy in young adults. *Journal* of Clinical Child and Adolescent Psychology, 36(3), 334–346.
- Byrd, A. L., Kahn, R. E., & Pardini, D. A. (2013). A validation of the Inventory of Callous–Unemotional Traits in a community sample of young adult males. *Journal of Psychopathology and Behavioral Assessment*, 35(1), 20–34.
- Caldwell, M., Skeem, J., Salekin, R., & Van Rybroek, G. (2006). Treatment response of adolescent offenders with psychopathy features a 2-year follow-up. Criminal Justice and Behavior, 33(5), 571–596.
- Campbell, M. A., Doucette, N. L., & French, S. (2009). Validity and stability of the youth psychopathic traits inventory in a nonforensic sample of young adults. *Journal of Personality Assessment*, 91(6), 584–592.
- Cauffman, E., Kimonis, E. R., Dmitrieva, J., & Monahan, K. C. (2009). A multimethod assessment of juvenile psychopathy: Comparing the predictive utility of the PCL:YV, YPI, and NEO PRI. *Psychological Assessment*, 21(4), 528–542.
- Cecil, C. A., Lysenko, L. J., Jaffee, S. R., Pingault, J. B., Smith, R. G., Relton, C. L., et al. (2014). Environmental risk, oxytocin receptor gene (OXTR) methylation and youth callous–unemotional traits: A 13-year longitudinal study. *Molecular Psychiatry*, 19, 1071–1077.
- Cheng, Y., Hung, A. Y., & Decety, J. (2012). Dissociation between affective sharing and emotion understanding in juvenile psychopaths. *Development and Psychopathology*, 24(2), 623–636.
- Cicchetti, D. E., & Cohen, D. J. (Eds.). (1995). Developmental psychopathology: Vol. 1. Theory and methods. New York: Wiley.
- Cicchetti, D., & Rogosch, F. A. (1996). Equifinality and multifinality in developmental psychopathology. *De*velopment and Psychopathology, 8(4), 597–600.
- Cima, M., Smeets, T., & Jelicic, M. (2008). Self-reported

trauma, cortisol levels, and aggression in psychopathic and non-psychopathic prison inmates. *Biological Psychology*, 78(1), 75–86.

- Cleckley, H. (1976). The mask of sanity. St. Louis, MO: Mosby. (Original work published 1941)
- Cohn, M. D., Popma, A., van den Brink, W., Pape, L. E., Kindt, M., van Domburgh, L., et al. (2013). Fear conditioning, persistence of disruptive behavior and psychopathic traits: An fMRI study. *Translational Psychiatry*, 3(10), e319.
- Cooke, D. J., & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment*, 13(2), 171–188.
- Costa, P. T., Jr., & McCrae, R. R. (1992). Four ways five factors are basic. Personality and Individual Differences, 13(6), 653–665.
- Dadds, M. R., Allen, J. L., Oliver, B. R., Faulkner, N., Legge, K., Moul, C., et al. (2012). Love, eye contact and the developmental origins of empathy v. psychopathy. British Journal of Psychiatry, 200(3), 191–196.
- Dadds, M. R., Cauchi, A. J., Wimalaweera, S., Hawes, D. J., & Brennan, J. (2012). Outcomes, moderators, and mediators of empathic-emotion recognition training for complex conduct problems in childhood. *Psychiatry Research*, 199(3), 201–207.
- Dadds, M. R., El Masry, Y., Wimalaweera, S., & Guastella, A. J. (2008). Reduced eye gaze explains "fear blindness" in childhood psychopathic traits. *Journal* of the American Academy of Child and Adolescent Psychiatry, 47, 455–463.
- Dadds, M. R., Fraser, J., Frost, A., & Hawes, D. J. (2005). Disentangling the underlying dimensions of psychopathy and conduct problems in childhood: A community study. *Journal of Consulting and Clinical Psychology*, 73(3), 400–410.
- Dadds, M. R., Jambrak, J., Pasalich, D., Hawes, D. J., & Brennan, J. (2011). Impaired attention to the eyes of attachment figures and the developmental origins of psychopathy. *Journal of Child Psychology and Psychia*try, 52(3), 238–245.
- Dadds, M. R., MacDonald, E., Cauchi, A., Williams, K., Levy, F., & Brennan, J. (2014). Nasal oxytocin for social deficits in childhood autism: A randomized controlled trial. *Journal of Autism and Developmental Disorders*, 44(3), 521–531.
- Dadds, M. R., Moul, C., Cauchi, A., Hawes, D. J., & Brennan, J. (2013). Replication of a ROBO2 polymorphism associated with conduct problems but not psychopathic tendencies in children. *Psychiatric Genetics*, 23(6), 251–254.
- Dadds, M. R., Perry, Y., Hawes, D. J., Merz, S., Riddell, A. C., Haines, D. J., et al. (2006). Attention to the eyes and fear-recognition deficits in child psychopathy. *British Journal of Psychiatry*, 189, 280–281.
- Datyner, A. C., Kimonis, E. R., Hunt, E., & Armstrong, K. A. (2016). Using a novel emotional skills module to enhance empathic responding for a child with

conduct problems with limited prosocial emotions. *Clinical Case Studies*, *15*(1), 35–52.

- de Wied, M., van Boxtel, A., Matthys, W., & Meeus, W. (2012). Verbal, facial and autonomic responses to empathy-eliciting film clips by disruptive male adolescents with high versus low callous–unemotional traits. Journal of Abnormal Child Psychology, 40(2), 211–223.
- Dolan, M., & Rennie, C. (2006). Psychopathy Checklist: Youth Version and Youth Psychopathic Trait Inventory: A comparison study. *Personality and Indi*vidual Differences, 41(4), 779–789.
- Drislane, L. E., Brislin, S. J., Kendler, K. S., Andershed, H., Larsson, H., & Patrick, C. J. (2014). A triarchic model analysis of the Youth Psychopathic Traits Inventory. *Journal of Personality Disorders*, 29(1), 15–41.
- Drislane, L. E., Patrick, C. J., & Arsal, G. (2014). Clarifying the content coverage of differing psychopathy inventories through reference to the triarchic psychopathy measure. *Psychological Assessment*, 26, 350–362.
- Edens, J. F., Boccaccini, M. T., & Johnson, D. W. (2010). Inter-rater reliability of the PCL-R total and factor scores among psychopathic sex offenders: Are personality features more prone to disagreement than behavioural features? *Behavioral Sciences and Law*, 28, 106–119.
- Edens, J. F., Marcus, D., & Vaughn, M. G. (2011). Exploring the taxometric status of psychopathy among youthful offenders: Is there a juvenile psychopath taxon? *Law and Human Behavior*, 35(1), 13–24.
- Essau, C. A., Sasagawa, S., & Frick, P. J. (2006). Callous-unemotional traits in a community sample of adolescents. Assessment, 13(4), 454–469.
- Ezpeleta, L., de la Osa, N., Granero, R., Penelo, E., & Domènech, J. M. (2013). Inventory of callous–unemotional traits in a community sample of preschoolers. Journal of Clinical Child and Adolescent Psychology, 42(1), 91–105.
- Fanti, K. A. (2013). Individual, social, and behavioral factors associated with co-occurring conduct problems and callous–unemotional traits. *Journal of Abnormal Child Psychology*, 41(5), 811–824.
- Fanti, K. A., Frick, P. J., & Georgiou, S. (2009). Linking callous–unemotional traits to instrumental and noninstrumental forms of aggression. *Journal of Psychopathology and Behavioral Assessment*, 31(4), 285–298.
- Fanti, K., Kimonis, E. R., Hadjicharalambous, M. Z., & Steinberg, L. (2016). Do neurocognitive deficits in decision making differentiate conduct disorder subtypes? *European Child and Adolescent Psychiatry*, 25(9), 989–996.
- Feilhauer, J., Cima, M., & Arntz, A. (2012). Assessing callous–unemotional traits across different groups of youths: Further cross-cultural validation of the Inventory of Callous–Unemotional Traits. International Journal of Law and Psychiatry, 35(4), 251–262.
- Finger, E. C., Marsh, A. A., Blair, K. S., Reid, M. E., Sims, C., Ng, P., et al. (2011). Disrupted reinforcement sig-

naling in the orbitofrontal cortex and caudate in youths with conduct disorder or oppositional defiant disorder and a high level of psychopathic traits. *American Journal of Psychiatry*, 168(2), 152–162.

- Finger, E. C., Marsh, A. A., Mitchell, D. G., Reid, M. E., Sims, C., Budhani, S., et al. (2008). Abnormal ventromedial prefrontal cortex function in children with psychopathic traits during reversal learning. Archives of General Psychiatry, 65(5), 586–594.
- Fite, P. J., Greening, L., Stoppelbein, L., & Fabiano, G. A. (2008). Confirmatory factor analysis of the Antisocial Process Screening Device with a clinical inpatient population. Assessment, 16(1), 103–114.
- Fontaine, N., Barker, E. D., Salekin, R. T., & Viding, E. (2008). Dimensions of psychopathy and their relationships to cognitive functioning in children. *Journal of Clinical Child and Adolescent Psychology*, 37(3), 690–696.
- Fontaine, N. M., Rijsdijk, F. V., McCrory, E. J., & Viding, E. (2010). Etiology of different developmental trajectories of callous–unemotional traits. *Journal of* the American Academy of Child and Adolescent Psychiatry, 49(7), 656–664.
- Forsman, M., Lichtenstein, P., Andershed, H., & Larsson, H. (2008). Genetic effects explain the stability of psychopathic personality from mid- to late adolescence. *Journal of Abnormal Psychology*, 117(3), 606–617.
- Forth, A. E., Kosson, D. S., & Hare, R. D. (2003). Hare Psychopathy Checklist: Youth Version (PCL:YV). Toronto: Multi-Health Systems.
- Fowler, T., Langley, K., Rice, F., van den Bree, M. B., Ross, K., Wilkinson, L. S., et al. (2009). Psychopathy trait scores in adolescents with childhood ADHD: The contribution of genotypes affecting MAOA, 5HTT and COMT activity. *Psychiatric Genetics*, 19(6), 312–319.
- Fowles, D. C., & Kochanska, G. (2000). Temperament as a moderator of pathways to conscience in children: The contribution of electrodermal activity. *Psychophysiology*, 37(6), 788–795.
- Frick, P. J. (2003). The inventory of callous-unemotional traits. Unpublished rating scale, University of New Orleans, New Orleans, LA.
- Frick, P. J., Barry, C. T., & Kamphaus, R. W. (2010). Clinical assessment of children's personality and behavior. New York: Springer.
- Frick, P. J., Bodin, S. D., & Barry, C. T. (2000). Psychopathic traits and conduct problems in community and clinic-referred samples of children: Further development of the psychopathy screening device. Psychological Assessment, 12(4), 382–393.
- Frick, P. J., Cornell, A. H., Barry, C. T., Bodin, S. D., & Dane, H. E. (2003). Callous–unemotional traits and conduct problems in the prediction of conduct problem severity, aggression, and self-report of delinquency. *Journal of Abnormal Child Psychology*, 31(4), 457–470.

- Frick, P. J., & Hare, R. D. (2001). The Antisocial Process Screening Device. Toronto: Multi-Health Systems.
- Frick, P. J., Kimonis, E. R., Dandreaux, D. M., & Farell, J. M. (2003). The 4 year stability of psychopathic traits in non-referred youth. *Behavioral Sciences and the Law*, 21(6), 713–736.
- Frick, P. J., & Moffitt, T. E. (2010). A proposal to the DSM-V Childhood Disorders and the ADHD and Disruptive Behavior Disorders Work Groups to include a specifier to the diagnosis of conduct disorder based on the presence of callous-unemotional traits. Washington, DC: American Psychiatric Association.
- Frick, P. J., & Ray, J. V. (2014). Evaluating callous–unemotional traits as a personality construct. *Journal of Personality*, 83(6), 710–722.
- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014a). Annual Research Review: A developmental psychopathology approach to understanding callous–unemotional traits in children and adolescents with serious conduct problems. *Journal of Child Psychology and Psychiatry*, 55(6), 532–548.
- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014b). Can callous–unemotional traits enhance the understanding, diagnosis, and treatment of serious conduct problems in children and adolescents?: A comprehensive review. *Psychological Bulletin*, 140(1), 1–57.
- Frick, P. J., & Viding, E. (2009). Antisocial behavior from a developmental psychopathology perspective. *Development and Psychopathology*, 21(4), 1111–1131.
- Fung, M. T., Raine, A., Loeber, R., Lynam, D. R., Steinhauer, S. R., Venables, P. H., et al. (2005). Reduced electrodermal activity in psychopathy-prone adolescents. *Journal of Abnormal Psychology*, 114(2), 187–196.
- Glenn, A. L., Raine, A., Schug, R. A., Gao, Y., & Granger, D. A. (2011). Increased testosterone-tocortisol ratio in psychopathy. *Journal of Abnormal Psychology*, 120(2), 389–399.
- Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A research note. *Journal of Child Psy*chology and Psychiatry, 38(5), 581–586.
- Hare, R. D. (1991). Manual for the Hare Psychopathy Checklist—Revised. Toronto: Multi-Health Systems.
- Hare, R. D. (2003). Manual for the Revised Psychopathy Checklist—Revised (2nd ed.). Toronto: Multi-Health Systems.
- Harenski, C. L., Kim, S. H., & Hamann, S. (2009). Neuroticism and psychopathy predict brain activation during moral and nonmoral emotion regulation. *Cognitive, Affective, and Behavioral Neuroscience*, 9(1), 1–15.
- Hart, S. D., Cox, D. N., & Hare, R. D. (1995). Manual for the Psychopathy Checklist: Screening Version (PCL:SV). Toronto: Multi-Health Systems.
- Hawes, D. J., Brennan, J., & Dadds, M. R. (2009). Cortisol, callous–unemotional traits, and pathways to antisocial behavior. *Current Opinion in Psychiatry*, 22(4), 357–362.
- Hawes, D. J., & Dadds, M. R. (2005). The treatment of conduct problems in children with callous–unemotional traits. *Journal of Consulting and Clinical Psychology*, 73(4), 737–741.
- Hawes, D. J., Dadds, M. R., Brennan, J., Rhodes, T., & Cauchi, A. (2013). Revisiting the treatment of conduct problems in children with callous–unemotional traits. Australian and New Zealand Journal of Psychiatry, 47(7), 646–653.
- Hawes, D. J., Price, M. J., & Dadds, M. R. (2014). Callous–unemotional traits and the treatment of conduct problems in childhood and adolescence: A comprehensive review. Clinical Child and Family Psychology Review, 17(3), 248–276.
- Hawes, S. W., Byrd, A. L., Henderson, C. E., Gazda, R. L., Burke, J. D., Loeber, R., et al. (2014). Refining the parent-reported Inventory of Callous–Unemotional Traits in boys with conduct problems. *Psychological Assessment*, 26(1), 256–266.
- Henry, J., Pingault, J. B., Boivin, M., Rijsdijk, F., & Viding, E. (2016). Genetic and environmental aetiology of the dimensions of callous–unemotional traits. *Psychological Medicine*, 46(2), 405–414.
- Hodsoll, S., Lavie, N., & Viding, E. (2014). Emotional attentional capture in children with conduct problems: The role of callous–unemotional traits. *Frontiers in Human Neuroscience*, 8, Article No. 570.
- Holi, M., Auvinen-Lintunen, L., Lindberg, N., Tani, P., & Virkkunen, M. (2006). Inverse correlation between severity of psychopathic traits and serum cortisol levels in young adult violent male offenders. *Psychopathology*, 39(2), 102–104.
- Hwang, S., Nolan, Z. T., White, S. F., Williams, W. C., Sinclair, S., & Blair, R. J. (2016). Dual neurocircuitry dysfunctions in disruptive behavior disorders: Emotional responding and response inhibition. *Psychological Medicine*, 46(7), 1485–1496.
- Hyde, L. W., Waller, R., Trentacosta, C. J., Shaw, D. S., Neiderhiser, J. M., Ganiban, J. M., et al. (2016). Heritable and nonheritable pathways to early callous–unemotional behaviors. *American Journal of Psychiatry*, 173(9), 903–910.
- Isen, J., Raine, A., Baker, L., Dawson, M., Bezdjian, S., & Lozano, D. I. (2010). Sex-specific association between psychopathic traits and electrodermal reactivity in children. *Journal of Abnormal Psychology*, 119(1), 216–225.
- Johnson, M. M., Dismukes, A. R., Vitacco, M. J., Breiman, C., Fleury, D., & Shirtcliff, E. A. (2014). Psychopathy's influence on the coupling between hypothalamic–pituitary–adrenal and gonadal axes among incarcerated adolescents. *Developmental Psychobiol*ogy, 56(3), 448–458.
- Jones, A. P., Happé, F. G., Gilbert, F., Burnett, S., & Viding, E. (2010). Feeling, caring, knowing: Different types of empathy deficit in boys with psychopathic tendencies and autism spectrum disorder. *Journal of Child Psychology and Psychiatry*, 51(11), 1188–1197.

- Jones, A. P., Riley, R. D., Williamson, P. R., & Whitehead, A. (2009). Meta-analysis of individual patient data versus aggregate data from longitudinal clinical trials. *Clinical Trials*, 6(1), 16–27.
- Kerr, M., Van Zalk, M., & Stattin, H. (2012). Psychopathic traits moderate peer influence on adolescent delinquency. *Journal of Child Psychology and Psychia*try, 53(8), 826–835.
- Kiehl, K. A., Smith, A. M., Hare, R. D., Mendrek, A., Forster, B. B., Brink, J., et al. (2001). Limbic abnormalities in affective processing by criminal psychopaths as revealed by functional magnetic resonance imaging. *Biological Psychiatry*, 50(9), 677–684.
- Kimonis, E. R., Bagner, D. M., Linares, D., Blake, C. A., & Rodriguez, G. (2014). Parent training outcomes among young children with callous–unemotional conduct problems with or at risk for developmental delay. *Journal of Child and Family Studies*, 23(2), 437–448.
- Kimonis, E. R., Branch, J., Hagman, B., Graham, N., & Miller, C. (2013). The psychometric properties of the Inventory of Callous–Unemotional Traits in an undergraduate sample. *Psychological Assessment*, 25(1), 84–93.
- Kimonis, E. R., Cross, B., Howard, A., & Donoghue, K. (2013). Maternal care, maltreatment, and callous–unemotional traits among urban male juvenile offenders. *Journal of Youth and Adolescence*, 42(2), 165–177.
- Kimonis, E. R., Fanti, K. A., Anastassiou-Hadjicharalambous, X., Mertan, B., Goulter, N., & Katsimicha, E. (2016). Can callous–unemotional traits be reliably measured in preschoolers? *Journal of Abnormal Child Psychology*, 44(4) 625–638.
- Kimonis, E. R., Fanti, K. A., Frick, P. J., Moffitt, T. E., Essau, C., Bijttebier, P., et al. (2015). Using self-reported callous–unemotional traits to cross-nationally assess the DSM-5 "With Limited Prosocial Emotions" specifier. Journal of Child Psychology and Psychiatry, 56(11), 1249–1261.
- Kimonis, E. R., Fanti, K. A., Goulter, N., & Hall, J. (2017). Affective startle potentiation differentiates primary and secondary variants of juvenile psychopathy. *Development and Psychopathology*, 29(4), 1149–1160.
- Kimonis, E. R., Frick, P. J., & Barry, C. T. (2004). Callous–unemotional traits and delinquent peer affiliation. *Journal of Consulting and Clinical Psychology*, 72(6), 956–966.
- Kimonis, E. R., Frick, P. J., Cauffman, E., Goldweber, A., & Skeem, J. (2012). Primary and secondary variants of juvenile psychopathy differ in emotional processing. Development and Psychopathology, 24, 1091–1103.
- Kimonis, E. R., Frick, P. J., Fazekas, H., & Loney, B. R. (2006). Psychopathic traits, aggression, and the processing of emotional stimuli in non-referred children. *Behavioral Sciences and the Law*, 24, 21–37.
- Kimonis, E. R., Frick, P. J., Muñoz, L. C., & Aucoin, K. J. (2007). Can a laboratory measure of emotional

processing enhance the statistical prediction of aggression and delinquency in detained adolescents with callous–unemotional traits? *Journal of Abnormal Child Psychology*, 35(5), 773–785.

- Kimonis, E. R., Frick, P. J., Muñoz, L. C., & Aucoin, K. J. (2008). Callous–unemotional traits and the emotional processing of distress cues in detained boys: Testing the moderating role of aggression, exposure to community violence, and histories of abuse. *Devel*opment and Psychopathology, 20(2), 569–589.
- Kimonis, E. R., Frick, P. J., Skeem, J. L., Marsee, M. A., Cruise, K., Munoz, L. C., et al. (2008). Assessing callous–unemotional traits in adolescent offenders: Validation of the Inventory of Callous–Unemotional Traits. International Journal of Law and Psychiatry, 31(3), 241–252.
- Kimonis, E. R., Goulter, N., Hawes, D. J., Wilbur, R. R., & Groer, M. W. (2017). Neuroendocrine factors distinguish juvenile psychopathy variants. *Developmental Psychobiology*, 59(2), 161–173.
- Kimonis, E. R., Kennealy, P. J., & Goulter, N. (2016). Does the self-report Inventory of Callous–Unemotional Traits predict recidivism? *Psychological Assessment*, 28(12), 1616–1624.
- Kimonis, E. R., Skeem, J., Cauffman, E., & Dmitrieva, J. (2011). Are secondary variants of "juvenile psychopathy" more reactively violent and less psychosocially mature than primary variants? *Law and Human Behavior*, 35(5), 381–391.
- Kochanska, G. (1997). Multiple pathways to conscience for children with different temperaments: From toddlerhood to age 5. Developmental Psychology, 33(2), 228–240.
- Kolko, D. J., & Pardini, D. A. (2010). ODD dimensions, ADHD, and callous–unemotional traits as predictors of treatment response in children with disruptive behavior disorders. *Journal of Abnormal Psychology*, 119(4), 713–725.
- Kotler, J. S., & McMahon, R. J. (2010). Assessment of child and adolescent psychopathy. In R. J. Salekin & D. R. Lynam (Eds.), *Handbook of child and adolescent* psychopathy (pp. 79–109). New York: Guilford Press.
- Kumsta, R., Sonuga-Barke, E., & Rutter, M. (2012). Adolescent callous–unemotional traits and conduct disorder in adoptees exposed to severe early deprivation. British Journal of Psychiatry, 200(3), 197–201.
- Larsson, H., Viding, E., Rijsdijk, F. V., & Plomin, R. (2008). Relationships between parental negativity and childhood antisocial behavior over time: A bidirectional effects model in a longitudinal genetically informative design. *Journal of Abnormal Child Psychology*, 36(5), 633–645.
- Lee, Z., Klaver, J. R., Hart, S. D., Moretti, M. M., & Douglas, K. S. (2009). Short-term stability of psychopathic traits in adolescent offenders. *Journal* of Clinical Child and Adolescent Psychology, 38(5), 595–605.
- Leistico, A. M. R., Salekin, R. T., DeCoster, J., & Rogers, R. (2008). A large-scale meta-analysis relating

the Hare measures of psychopathy to antisocial conduct. *Law and Human Behavior*, 32(1), 28–45.

- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment*, 66(3), 488–524.
- Lilienfeld, S. O., & Widows, M. R. (2005). Psychopathic Personality Inventory—Revised (PPI-R): Professional manual. Lutz, FL: Psychological Assessment Resources.
- Lockwood, P. L., Sebastian, C. L., McCrory, E. J., Hyde, Z. H., Gu, X., De Brito, S. A., et al. (2013). Association of callous traits with reduced neural response to others' pain in children with conduct problems. *Current Biology*, 23(10), 901–905.
- Loeber, R., & Pardini, D. (2008). Neurobiology and the development of violence: Common assumptions and controversies. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 363, 2491–2503.
- Loney, B. R., Butler, M. A., Lima, E. N., Counts, C. A., & Eckel, L. A. (2006). The relation between salivary cortisol, callous–unemotional traits, and conduct problems in an adolescent non-referred sample. *Journal of Child Psychology and Psychiatry*, 47(1), 30–36.
- Loney, B. R., Frick, P. J., Clements, C. B., Ellis, M. L., & Kerlin, K. (2003). Callous–unemotional traits, impulsivity, and emotional processing in adolescents with antisocial behavior problems. *Journal of Clinical Child and Adolescent Psychology*, 32(1), 66–80.
- Loney, B. R., Taylor, J., Butler, M. A., & Iacono, W. G. (2007). Adolescent psychopathy features: 6-year temporal stability and the prediction of externalizing symptoms during the transition to adulthood. Aggressive Behavior, 33(3), 242–252.
- Lozier, L. M., Cardinale, E. M., VanMeter, J. W., & Marsh, A. A. (2014). Mediation of the relationship between callous–unemotional traits and proactive aggression by amygdala response to fear among children with conduct problems. JAMA Psychiatry, 71(6), 627–636.
- Lynam, D. R. (1997). Pursuing the psychopath: Capturing the fledgling psychopath in a nomological net. *Journal of Abnormal Psychology*, 106(3), 425–438.
- Lynam, D. R., Caspi, A., Moffitt, T. E., Loeber, R., & Stouthamer-Loeber, M. (2007). Longitudinal evidence that psychopathy scores in early adolescence predict adult psychopathy. *Journal of Abnormal Psychology*, 116(1), 155–165.
- Lynam, D. R., & Widiger, T. A. (2007). Using a general model of personality to identify the basic elements of psychopathy. *Journal of Personality Disorders*, 21(2), 160–178.
- Malik, A. I., Zai, C. C., Abu, Z., Nowrouzi, B., & Beitchman, J. H. (2012). The role of oxytocin and oxytocin receptor gene variants in childhood-onset aggression. *Genes*, *Brain and Behavior*, 11(5), 545–551.
- Marsh, A. A., & Blair, R. J. R. (2008). Deficits in facial affect recognition among antisocial populations: A

meta-analysis. Neuroscience and Biobehavioral Reviews, 32(3), 454–465.

- Marsh, A. A., Finger, E. C., Fowler, K. A., Adalio, C. J., Jurkowitz, I. T., Schechter, J. C., et al. (2013). Empathic responsiveness in amygdala and anterior cingulate cortex in youths with psychopathic traits. *Journal of Child Psychology and Psychiatry*, 54(8), 900–910.
- Marsh, A., Finger, E., Mitchell, D., Reid, M., Sims, C., Kosson, D., et al. (2008). Reduced amygdala response to fearful expressions in children and adolescents with callous–unemotional traits and disruptive behavior disorders. *American Journal of Psychiatry*, 165(6), 712–720.
- Marsh, A. A., Finger, E. C., Schechter, J. C., Jurkowitz, I. T., Reid, M. E., & Blair, R. J. R. (2011). Adolescents with psychopathic traits report reductions in physiological responses to fear. *Journal of Child Psychology* and Psychiatry, 52(8), 834–841.
- Mash, E., & Dozois, D. (2003). Child psychopathology: A developmental-systems perspective. In E. J. Mash & R. A. Barkley (Eds.), *Child psychopathology* (2nd ed., pp. 3–71). New York: Guilford Press.
- Michalska, K. J., Zeffiro, T. A., Decety, J. (2016). Brain response to viewing others being harmed in children with conduct disorder symptoms. *Journal of Child Psychology and Psychiatry*, 57(4), 510–519.
- Miller, C. S., Kimonis, E. R., Otto, R. K., Kline, S. M., & Wasserman, A. L. (2012). Reliability of risk assessment measures used in sexually violent predator proceedings. *Psychological Assessment*, 24(4), 944–953.
- Millon, T. (1993). Millon Adolescent Clinical Inventory manual. Minneapolis, MN: National Computer Systems.
- Mills-Koonce, W. R., Wagner, N. J., Willoughby, M. T., Stifter, C., Blair, C., & Granger, D. A. (2015). Greater fear reactivity and psychophysiological hyperactivity among infants with later conduct problems and callous–unemotional traits. *Journal of Child Psychol*ogy and Psychiatry, 56(2), 147–154.
- Mitchell, K. J. (2011). The miswired brain: Making connections from neurodevelopment to psychopathology. BMC *Biology*, 9, 23.
- Moul, C., Dobson-Stone, C., Brennan, J., Hawes, D., & Dadds, M. (2013). An exploration of the serotonin system in antisocial boys with high levels of callous– unemotional traits. *PLOS ONE*, 8(2), e56619.
- Muñoz, L. C. (2009). Callous–unemotional traits are related to combined deficits in recognizing afraid faces and body poses. *Journal of the American Academy of Child and Adolescent Psychiatry*, 48(5), 554–562.
- Muñoz, L. C., & Frick, P. J. (2007). The reliability, stability, and predictive utility of the self-report version of the Antisocial Process Screening Device. Scandinavian Journal of Psychology, 48(4), 299–312.
- Muñoz, L. C., Kerr, M., & Besic, N. (2008). The peer relationships of youths with psychopathic personality traits: A matter of perspective. *Criminal Justice and Behavior*, 35(2), 212–227.

- Murrie, D. C., & Cornell, D. G. (2000). The Millon Adolescent Clinical Inventory and psychopathy. *Journal* of Personality Assessment, 75(1), 110–125.
- Murrie, D. C., Marcus, D. K., Douglas, K. S., Lee, Z., Salekin, R. T., & Vincent, G. (2007). Youth with psychopathy features are not a discrete class: A taxometric analysis. *Journal of Child Psychology and Psychiatry*, 48(7), 714–723.
- Neumann, C. S., & Pardini, D. (2014). Factor structure and construct validity of the Self-Report Psychopathy (SRP) Scale and the Youth Psychopathic Traits Inventory (YPI) in young men. *Journal of Personality Disorders*, 28(3), 419–433.
- Obradović, J., Pardini, D., Long, J. D., & Loeber, R. (2007). Measuring interpersonal callousness in boys from childhood to adolescence: An examination of longitudinal invariance and temporal stability. *Journal of Clinical Child and Adolescent Psychology*, 36(3), 276–292.
- Pardini, D., Lochman, J., & Frick, P. (2003). Callous/ unemotional traits and social cognitive processes in adjudicated youth. *Journal of the American Academy* of Child and Adolescent Psychiatry, 42(3), 364–371.
- Pardini, D. A., Lochman, J. E., & Powell, N. (2007). The development of callous–unemotional traits and antisocial behavior in children: Are there shared and/or unique predictors? *Journal of Clinical Child and Adolescent Psychology*, 36(3), 319–333.
- Pasalich, D. S., Dadds, M. R., Hawes, D. J., & Brennan, J. (2011). Do callous–unemotional traits moderate the relative importance of parental coercion versus warmth in child conduct problems?: An observational study. *Journal of Child Psychology and Psychiatry*, 52(12), 1308–1315.
- Patrick, C. J. (2010). Conceptualizing the psychopathic personality: Disinhibited, bold, . . . or just plain mean? In R. T. Salekin & D. R. Lynam (Eds.), Handbook of child and adolescent psychopathy (pp. 15–48). New York: Guilford Press.
- Poustka, L., Maras, A., Hohm, E., Fellinger, J., Holtmann, M., Banaschewski, T., et al. (2010). Negative association between plasma cortisol levels and aggression in a high-risk community sample of adolescents. *Journal of Neural Transmission*, 117(5), 621–627.
- Poythress, N. G., Dembo, R., Wareham, J., & Greenbaum, P. E. (2006). Construct validity of the Youth Psychopathic Traits Inventory and the Antisocial Process Screening Device with justice-involved adolescents. Criminal Justice and Behavior, 33(1), 26–55.
- Rogers, R., Vitacco, M., Cruise, K., Sewell, K., & Neumann, C. (2002). Screening for adolescent psychopathy among at-risk youth: Initial validation of the Survey of Attitudes and Life Experiences. Assessment, 9(4), 343–350.
- Roose, A., Bijttebier, P., Decoene, S., Claes, L., & Frick, P. J. (2010). Assessing the affective features of psychopathy in adolescence: A further validation of the inventory of callous and unemotional traits. Assessment, 17(1), 44–57.

- Rowe, R., Costello, E. J., Angold, A., Copeland, W. E., & Maughan, B. (2010). Developmental pathways in oppositional defiant disorder and conduct disorder. *Journal of Abnormal Psychology*, 119(4), 726–738.
- Sadeh, N., Javdani, S., Jackson, J. J., Reynolds, E. K., Potenza, M. N., Gelernter, J., et al. (2010). Serotonin transporter gene associations with psychopathic traits in youth vary as a function of socioeconomic resources. *Journal of Abnormal Psychology*, 119(3), 604–609.
- Schwenck, C., Mergenthaler, J., Keller, K., Zech, J., Salehi, S., Taurines, R., et al. (2012). Empathy in children with autism and conduct disorder: Group-specific profiles and developmental aspects. *Journal of Child Psychology and Psychiatry*, 53(6), 651–659.
- Seara-Cardoso, A., & Viding, E. (2014). Functional neuroscience of psychopathic personality in adults. *Journal of Personality*, 83(6), 722–737.
- Sebastian, C. L., McCrory, E. J., Cecil, C. A., Lockwood, P. L., De Brito, S. A., Fontaine, N. M., et al. (2012). Neural responses to affective and cognitive theory of mind in children with conduct problems and varying levels of callous–unemotional traits. Archives of General Psychiatry, 69(8), 814–822.
- Sellbom, M., & Phillips, T. R. (2013). An examination of the triarchic conceptualization of psychopathy in incarcerated and nonincarcerated samples. *Journal of Abnormal Psychology*, 122(1), 208–214.
- Skeem, J. L., & Cauffman, E. (2003). Views of the downward extension: Comparing the youth version of the Psychopathy Checklist with the Youth Psychopathic Traits Inventory. *Behavioral Sciences and the Law*, 21(6), 737–770.
- Somma, A., Borroni, S., Drislane, L. E., & Fossati, A. (2015). Assessing the triarchic model of psychopathy in adolescence: Reliability and validity of the Triarchic Psychopathy Measure (TriPM) in three samples of Italian community-dwelling adolescents. *Psychological Assessment*, 28(4), e36–e48.
- Stadler, C., Kroeger, A., Weyers, P., Grasmann, D., Horschinek, M., Freitag, C., et al. (2011). Cortisol reactivity in boys with attention-deficit/hyperactivity disorder and disruptive behavior problems: The impact of callous unemotional traits. *Psychiatry Research*, 187(1), 204–209.
- Sylvers, P. D., Brennan, P. A., & Lilienfeld, S. O. (2011). Psychopathic traits and preattentive threat processing in children: A novel test of the fearlessness hypothesis. *Psychological Science*, 22(10), 1280–1287.
- Trzaskowski, M., Dale, P. S., & Plomin, R. (2013). No genetic influence for childhood behavior problems from DNA analysis. *Journal of American Academy of Child and Adolescent Psychiatry*, 52(10), 1048–1056.
- Vaughn, M. G., & Howard, M. O. (2005). Self-report measures of juvenile psychopathic personality traits: A comparative review. *Journal of Emotional and Behavioral Disorders*, 13(3), 152–162.
- Vaughn, M. G., Howard, M. O., & DeLisi, M. (2008). Psychopathic personality traits and delinquent ca-

reers: An empirical examination. International Journal of Law and Psychiatry, 31(5), 407–416.

- Vaughn, M. G., Litschge, C. L., DeLisi, M., Beaver, K. M., & McMillen, J. C. (2008). Psychopathic personality features and risks for criminal justice system involvement among emancipating foster youth. Children and Youth Services Review, 30, 1101–1110.
- Vaughn, M. G., Newhill, M., DeLisi, K. M., Beaver, K. M., & Howard, M. O. (2008). An investigation of psychopathic features among delinquent girls: Violence, theft, and drug abuse. Youth Violence and Juvenile Justice, 6(3), 240–255.
- Venables, N. C., Hall, J. R., & Patrick, C. J. (2014). Differentiating psychopathy from antisocial personality disorder: A triarchic model perspective. *Psychological Medicine*, 44(5), 1005–1013.
- Viding, E., Blair, R. J. R., Moffitt, T. E., & Plomin, R. (2005). Evidence for substantial genetic risk for psychopathy in 7-year-olds. *Journal of Child Psychology* and Psychiatry, 46(6), 592–597.
- Viding, E., Fontaine, N. M. G., Oliver, B. R., & Plomin, R. (2009). Negative parental discipline, conduct problems and callous–unemotional traits: Monozygotic twin differences study. *British Journal of Psychiatry*, 195, 414–419.
- Viding, E., Frick, P. J., & Plomin, R. (2007). Aetiology of the relationship between callous–unemotional traits and conduct problems in childhood. *British Journal of Psychiatry*, 190(Suppl. 49), S33–S38.
- Viding, E., Hanscombe, K. B., Curtis, C. J., Davis, O. S., Meaburn, E. L., & Plomin, R. (2010). In search of genes associated with risk for psychopathic tendencies in children: A two-stage genome-wide association study of pooled DNA. *Journal of Child Psychology* and Psychiatry, 51(7), 780–788.
- Viding, E., Jones, A. P., Paul, J. F., Moffitt, T. E., & Plomin, R. (2008). Heritability of antisocial behaviour at 9: Do callous–unemotional traits matter? *Developmental Science*, 11(1), 17–22.
- Viding, E., & McCrory, E. J. (2012). Why should we care about measuring callous–unemotional traits in children? British Journal of Psychiatry, 200(3), 177–178.
- Viding, E., Price, T. S., Jaffee, S. R., Trzaskowski, M., Davis, O. S., Meaburn, E. L., et al. (2013). Genetics of callous–unemotional behavior in children. PLOS ONE, 8(7), e65789.
- Viding, E., Sebastian, C. L., Dadds, M. R., Lockwood, P. L., Cecil, C. A., De Brito, S. A., et al. (2012). Amygdala response to preattentive masked fear in children with conduct problems: The role of callous–unemotional traits. *American Journal of Psychiatry*, 169(10), 1109–1116.
- Vincent, G. M., Vitacco, M. J., Grisso, T., & Corrado, R. R. (2003). Subtypes of adolescent offenders: Affective traits and antisocial behavior patterns. Behavioral Sciences and the Law, 21(6), 695–712.
- Visscher, P. M., Brown, M. A., McCarthy, M. I., & Yang, J. (2012). Five years of GWAS discovery. American Journal of Human Genetics, 90(1), 7–24.

- Wall, T. D., Frick, P. J., Fanti, K. A., & Kimonis, E. R. (2016). Factors differentiating callous–unemotional children with and without conduct problems. *Journal* of Child Psychology and Psychiatry, 57(8), 976–983.
- Waller, R., Gardner, F., & Hyde, L. W. (2013). What are the associations between parenting, callous–unemotional traits, and antisocial behavior in youth?: A systematic review of evidence. *Clinical Psychology Review*, 33(4), 593–608.
- White, S. F., Brislin, S. J., Sinclair, S., Fowler, K. A., Pope, K., & Blair, R. J. R. (2013). The relationship between large cavum septum pellucidum and antisocial behavior, callous–unemotional traits and psychopathy in adolescents. *Journal of Child Psychology* and Psychiatry, 54(5), 575–581.
- White, S. F., Fowler, K. A., Sinclair, S., Schechter, J. C., Majestic, C. M., Pine, D. S., et al. (2014). Disrupted expected value signaling in youth with disruptive behavior disorders to environmental reinforcers.

Journal of American Academy of Child and Adolescent Psychiatry, 53(5), 579–588.

- White, S. F., Marsh, A. A., Fowler, K. A., Schechter, J. C., Adalio, C., Pope, K., et al. (2012). Reduced amygdala response in youths with disruptive behavior disorders and psychopathic traits: Decreased emotional response versus increased top-down attention to nonemotional features. American Journal of Psychiatry, 169(7), 750–758.
- White, S. F., Williams, W. C., Brislin, S. J., Sinclair, S., Blair, K. S., Fowler, K. A., et al. (2012). Reduced activity within the dorsal endogenous orienting of attention network to fearful expressions in youth with disruptive behavior disorders and psychopathic traits. *Development and Psychopathology*, 24(3), 1105–1116.
- Yoder, K. J., Lahey, B. B., & Decety, J. (2016). Callous traits in children with and without conduct problems predict reduced connectivity when viewing harm to others. *Scientific Reports*, 6, Article No. 20216.

# CHAPTER 8

# Boldness

# Conceptual and Methodological Issues

SCOTT O. LILIENFELD ASHLEY L. WATTS SARAH FRANCIS SMITH ROBERT D. LATZMAN

Michael Harari (1927–2014) was known as the "Zionist James Bond," and for good reason. Daring, swashbuckling, and ruthlessly exacting, Harari was widely regarded as Israel's premier spy and hailed by Israeli Prime Minister Benjamin Netanyahu as "one of the greatest warriors for Israel's security" (Weber, 2014). One journalist described him as "a well-liked commander," but one who was "feared by all" (Bergman, 2014). His remarkable life history reads almost like the screenplay of a 007 film.

When he was 16, Harari lied about his age to gain employment with Palmach, a secret and illegal Israeli commando force; while at Palmach, he was arrested multiple times by British law enforcement authorities for unlawfully carrying weapons. Later employed by the Mossad, Israel's chief intelligence agency, Harari played a central role in smuggling Jews from Communist countries into Israel. He is reputed to have founded Kidon ("Spear"), a group that launched carefully plotted assassinations against enemy leaders. In 1976, he was involved in the planning of the famed Israeli raid at Entebbe airport in Uganda, where a group of nearly 100 individuals, mostly Israelis, were being held hostage by Palestinian militants following an aircraft hijacking. Disguised as an Italian businessman, Harari reportedly convinced airport authorities to allow him into the control tower, where he gathered intelligence information that would prove essential in the raid, which freed almost all of the hostages. In Beirut, Lebanon, he coordinated the 1979 car-bomb assassination of Ali Hassan Salameh, the terrorist who had headed the "Black September" group responsible for the 1972 massacre of 11 Israeli Olympic athletes in Munich. After retiring from the Mossad in the 1980s, Harari was called back to assist Israel with combatting Iran's nuclear ambitions; according to some accounts, he later worked as an aide for notorious Panamanian dictator Manuel Noriega, who was ultimately arrested on multiple corruption charges.

In many respects, Michael Harari exemplifies a set of personality traits that comprise a higherorder dimension termed "boldness" (Lykken, 1982, 1995; Patrick, 2006; Patrick, Fowles, & Krueger, 2009). These traits include interpersonal potency, charisma, physical fearlessness, venturesomeness, and novelty seeking, along with calmness in the face of danger. As described by American writer Tom Wolfe (1979) in his brilliant nonfiction account of the fearless test pilot Chuck Yeager and the early *Mercury* astronauts, *The Right Stuff* reflects the potent cocktail of derring-do, machismo, and sangfroid under intense pressure that boldness encompasses.

Nevertheless, the nature of boldness and its relevance to psychopathy have recently become flashpoints of intense scientific controversy (Lilienfeld, Patrick, et al., 2012; Lynam & Miller, 2013; Miller & Lynam, 2012; Patrick, Venables, & Drislane, 2013). In particular, experts in the field have debated whether boldness is an intrinsic feature of psychopathy, or is instead irrelevant or at best peripheral to it. Perhaps boldness is not part of psychopathy per se but only moderates its behavioral expression, predisposing individuals to "successful" or "adaptive" psychopathy (Hall & Benning, 2006; see also Lynam & Miller, 2013; Widom, 1977). Moreover, the question of whether boldness is entirely psychologically adaptive or, like other features of psychopathy, it also has a dark side (Paulhus & Williams, 2002), remains a point of contention. Perhaps when dispositional boldness becomes too extreme or when it is coupled with certain unsavory personality traits, such as poor impulse control or antagonism, or certain cognitive traits, such as low intelligence or poor executive functioning, the right stuff can transmute into the wrong stuff, crossing the murky boundary that separates bravery from reckless risk taking. Finally, if boldness is indeed relevant to psychopathy, do individuals with high levels of boldness alone, as was presumably the case with Michael Harari, qualify as psychopathic? Or instead, do high levels of boldness give rise to psychopathy only in the presence of certain other personality traits?

In this chapter, we examine these contentious questions with an eye toward resolving ongoing debates and encouraging fruitful avenues for research. We begin by introducing the concept of boldness, considering historical conceptions of psychopathy and their relevance to boldness, and then discussing the psychometric delineation of boldness and its antecedents in the individualdifferences literature. We then review findings pertaining to the psychological correlates and potential etiological bases of boldness, and explore the implications of this dispositional construct for interpersonal behavior. We conclude by discussing how research on boldness may necessitate a reconceptualization of psychopathy as a configural rather than an additive construct (see also Lilienfeld, 2013; Lilienfeld & Fowler, 2006; Lilienfeld, Watts, Smith, Berg, & Latzman, 2015b; Patrick & Drislane, 2015). Along the way, we address recent scientific controversies regarding the nature of boldness and its place within the broader nomological network of psychopathy. In the pages that follow, we reserve the term "boldness" to refer to the construct of interest, and use the term "fearless dominance" to refer to the most influential operationalization of this construct, to be described later.

## Boldness and Psychopathy: An Introduction

In his classic book, *The Mask of Sanity*, Georgia psychiatrist Hervey Cleckley (1941/1976) was the first scholar to systematically delineate in detail the core features of psychopathy, which he described as a condition marked by 16 distinct characteristics, including superficial charm and poise, absence of anxiety, guiltlessness, dishonesty, unreliability, self-centeredness, failure to form intimate personal attachments, and poor impulse control. According to Cleckley, psychopaths present with a façade of adaptive functioning, rendering them dangerous interpersonally and, more rarely, physically. As Cleckley wrote,

The psychopath, however perfectly he mimics man theoretically, that is to say, when he speaks for himself in words, fails altogether when he is put into the practice of actual living. His failure is so complete and so dramatic that it is difficult to see how such a failure could be achieved by anyone less defective than a downright madman or by a person totally or almost totally unable to grasp emotionally the major components of meaning or feeling implicit in the thoughts that he expresses or the experiences he appears to go through. (p. 370)

In other words, according to Cleckley, although psychopaths typically behave antisocially, they are anything but "ordinary" antisocial individuals. Instead, they engage in rampant troublemaking, but do so with the superficial appearance of healthy adjustment. This paradoxical combination of attributes makes psychopaths especially problematic for others, as they can readily dupe observers into believing that they are innocuous (Patrick & Bernat, 2009).

Some consider the prototypical psychopath to be exemplified by Theodore (Ted) Bundy (1946–1989), a notorious American serial killer renowned for his charisma, gift of gab, outrageous risk taking, ruthlessness, and extraordinary callousness. Bundy, a former psychology major who once worked on a suicide crisis hotline and attended law school, lured scores of women into his Volkswagen Beetle (in some cases, tricking them into assisting him with transporting a large load of books into the car), later brutally raping and killing them. Another individual who appeared to embody many of the features of classical psychopathy, albeit in a form that was more self-damaging than physically harmful to others, was famed motorcycle stunt rider Robert Craig ("Evel") Knievel (1938–2007). Knievel once told a journalist, "I really wanted to fly through the air. I was a daredevil, a performer. I loved the thrill, the money, the whole macho thing" (Jordan, 2007). Although charismatic, flamboyant, and muchbeloved by his fans, Knievel clearly had a dark side. He once physically attacked a writer who alleged that Knievel had assaulted his own wife and children and abused illegal drugs, clubbing the accuser repeatedly over the head with an aluminum baseball bat-despite wearing casts on both arms from a recent motorcycle accident. It seems clear that both Bundy and Knievel displayed most or all of the features of boldness, conjoined in each case with more malevolent traits.

More than 60 years after Cleckley's seminal writings, Patrick (2006; see also Chapter 1, this volume) proposed that boldness captures much of what Cleckley (1941/1976) referred to as the "mask" of superficially healthy functioning displayed by psychopathic individuals. Underscoring the relevance of boldness to psychopathy, Crego and Widiger (2016) asked laypersons to rate (using a 1- to 5-point scale) Cleckley's 15 classic case histories in terms of a variety of personality trait descriptors. They found that raters assigned moderately high or high scores to numerous trait descriptors linked to boldness, including fearless (3.79), self-assured (4.13), stress immune (3.55), unconcerned (4.0), bold (4.03), socially influential (3.79), and dominant (3.44). Presuming that Cleckley's original cases largely reflected prototypical psychopaths, these findings suggest that boldness is a key element of the prototype of psychopathy (but see Miller & Lynam, 2015, for a different view).

#### Psychometric Emergence of Fearless Dominance

The boldness construct traces its origins to research on the Psychopathic Personality Inventory (PPI), a widely used self-report measure of psychopathy, and its revised version, the PPI–Revised (PPI-R; Lilienfeld & Widows, 2005). In constructing the PPI, Lilienfeld (1990; see also Lilienfeld & Andrews, 1996) used a hybrid inductive–deductive approach (see Tellegen & Waller, 2008) to identify salient constructs relevant to psychopathy, as well as several candidate items for each construct. He began by surveying the broad historical, clinical, and research literatures on psychopathy, and identified over 30 focal constructs that had been deemed relevant to this condition by influential authors over the years (e.g., Albert, Brigante, & Chase, 1959; Cleckley, 1941/1976; Gray & Hutchison, 1964; Hare, 1982; Lykken, 1957). Lilienfeld and other colleagues with expertise in psychopathy, including David Lykken (his PhD advisor), then wrote multiple items to assess each construct.

Exploratory factor analyses of the PPI item pool across three rounds of test development in undergraduate samples (N = 1,156) yielded eight lowerorder subscales: (1) Machiavellian Egocentricity (a ruthless and self-centered willingness to exploit others); (2) Social Potency, renamed Social Influence in the PPI-R (a propensity to enjoy influencing others and to relish being in the spotlight); (3) Fearlessness (a paucity of fear in anticipation of immediately impending danger); (4) Impulsive Nonconformity, renamed Rebellious Nonconformity in the PPI-R (a tendency to flout traditions and defy authority); (5) Carefree Nonplanfulness (an insouciant disregard for the future); (6) Blame *Externalization* (a propensity to adopt the victim role and to blame others for adverse life circumstances); (7) Stress Immunity (a relative absence of subjective anxiety in anticipation of harrowing circumstances); and (8) Coldheartedness (affective detachment from others, manifested by absence of genuine guilt, empathy, love, or loyalty).

In his initial exploratory, higher-order factor analyses of the PPI's eight subscales in undergraduates, Lilienfeld (1990) found that four of the subscales, namely, Fearlessness, Social Potency, Stress Immunity, and Impulsive Nonconformity, loaded on a higher-order dimension in both twoand three-factor solutions. Lilienfeld provisionally dubbed this higher-order dimension "Low Anxiety," but he did not pursue it in further research. In subsequent exploratory factor analyses of the PPI subscales in a community twin sample, Benning, Patrick, Hicks, Blonigen, and Krueger (2003) revisited this question. Their aim in doing so was to identify distinct elements of PPI psychopathy that might differentially predict "aversive startle potentiation," entailing heightened startle (e.g., eyeblink) reactivity to noise probes occurring in the presence of threatening visual foregrounds. In their now influential analyses, Benning and colleagues identified a two-factor structure for the PPI.

The first PPI higher-order dimension, which Benning, Patrick, Blonigen, Hicks, and Iacono (2005) termed "Fearless Dominance" (FD), was marked by high loadings on the Social Potency, Fearlessness, and Stress Immunity subscales; in contrast to Lilienfeld (1990), they did not find that Impulsive Nonconformity loaded substantially on this dimension. Benning and colleagues' FD dimension has become perhaps the most influential operationalization of boldness. Later researchers have used multiple regression equations to extract FD estimates from other well-validated indices of personality and psychopathology, such as the Multidimensional Personality Questionnaire (Benning, Patrick, Blonigen, et al., 2005), the Neuroticism-Extraversion-Openness Personality Inventory-Revised (NEO-PI-R; Ross, Benning, Patrick, Thompson, & Thurston, 2009), and the Minnesota Multiphasic Personality Inventory-2 (MMPI-2; Sellbom et al., 2012).

The second PPI higher-order dimension, which Benning, Patrick, Blonigen, and colleagues (2005) termed "Impulsive Antisociality," was marked by high loadings on the Machiavellian Egocentricity, Impulsive Nonconformity, Carefree Nonplanfulness, and Blame Externalization subscales; Lilienfeld and Widows (2005) later dubbed this dimension "Self-Centered Impulsivity (SCI)," the appellation we use for the remainder of this chapter. The Coldheartedness subscale of the PPI did not load highly on either dimension and was excluded from computation of the higher-order factors. In contemporary research, Coldheartedness is sometimes treated as a stand-alone dimension in analyses of the PPI and PPI-R.

Strikingly, in contrast to the two higher-order dimensions of most other psychopathy measures, such as the widely used Psychopathy Checklist-Revised (PCL-R; Hare, 1991/2003), FD and SCI were largely orthogonal (uncorrelated) in Benning and colleagues' (2003) analyses, a finding buttressed by a subsequent meta-analysis (Marcus, Fulton, & Edens, 2013; see also Malterer, Lilienfeld, Neumann, & Newman, 2010). Given that many or most authors regard psychopathy as a classical syndrome, that is, as a set of covarying features, this surprising finding raises intriguing questions about the validity of the boldness construct and, perhaps more provocatively, the nature of the psychopathy construct itself. We revisit these intriguing questions later in the chapter.

#### The Etiology of Boldness

Although the etiology of boldness remains the subject of debate, Patrick and colleagues (2009) conjectured that it stems from individual differ-

ences in the sensitivity of the brain's defensive systems, including those rooted in the amygdala and other structures involved in threat processing (see LeDoux, 2015, for a discussion). In this respect, the boldness construct bears clear-cut implications for the overarching construct of Negative Valence Systems within the Research Domain and Criteria (RDoC) framework recently put forth by the National Institute of Mental Health (Cuthbert & Insel, 2013; Insel et al., 2010). In particular, boldness appears to map closely onto the RDoC subconstructs of acute threat and potential threat, which in turn are presumably related to the psychological experiences of fear and anxiety, respectively (LeDoux, 2015; Sylvers, Lilienfeld, & LaPrarie, 2011). The physiology of these emotions has now been well documented by neuroscientists (e.g., Davis, 2006). In particular, fear, which reflects responsivity to imminent or unavoidable danger, appears to be preferential to the lateral and central nuclei of the amygdala, whereas anxiety, which reflects responsivity to ambiguous perceived threat, appears to be preferential to the bed nucleus of the stria terminalis.

At the same time, fear and anxiety are almost certainly emergent properties arising from the interplay of multiple brain circuits. For example, higher-level cortical areas, such as the orbitofrontal cortex and cingulate gyrus, also play key roles in the emotions of fear and anxiety. More broadly, some authors (e.g., LeDoux, 2015) have argued that only animals with consciousness, presumably humans, can experience genuine fear or anxiety given that these emotions require the capacity to consciously reflect on one's imminent or impending plight.

Psychophysiological and behavioral data support the hypothesized link between boldness and the RDoC Negative Valence Systems domain. Indeed, compared with individuals exhibiting low levels of FD, individuals with elevated levels of FD tend to display low levels of aversive startle potentiation (Benning, Patrick, & Iacono, 2005; Dvorak-Bertsch, Curtin, Rubinstein, & Newman, 2009; Vaidyanathan, Hall, Patrick, & Bernat, 2011; see also Lilienfeld, Patrick, et al., 2012) as well as low electrodermal (skin conductance) activity in anticipation of loud, aversive noises (Dindo & Fowles, 2011; see also López, Poy, Patrick, & Moltó, 2013). Complementing these findings are data from a study of 77 captivity-reared chimpanzees who were rated by caretakers on various trait characteristics using an established primate personality instrument, with items relevant to boldness identified by psychopathy experts (Latzman et al., 2016). Specifically, chimpanzees who were rated as high on boldness-related traits displayed significantly more approach behavior to a novel and potentially threatening stimulus—a human mannequin—than did chimpanzees low in boldness, consistent with the hypothesis that boldness is associated with lower sensitivity to perceived danger.

Taken together, these diverse findings point to a low level of responsiveness in the defensive system among individuals with elevated levels of boldness (see also Watts, Lilienfeld, DeMartino, & Sauvigné, 2015, for preliminary meta-analytic evidence). According to Patrick and colleagues' (2009) defensive processing model of boldness (see also Lykken, 1995), individuals with a lowered sensitivity to threatening cues are prone to a fearless temperament in childhood that tends to develop into social confidence, venturesomeness, and emotional resilience in adolescence and adulthood.

Patrick and colleagues' (2009) hypothesis regarding the etiology of boldness harkens back to Lykken's (1957, 1982) influential view that psychopathy is associated with what he termed a "low fear IQ," that is, a heightened threshold for responding to fear-provoking stimuli. In a classic early study, Lykken (1957) showed that, compared with nonpsychopathic delinquents, psychopathic delinquents (1) scored lower on a self-report index of harm avoidance, (2) displayed lower skin conductance activity in response to conditioned stimuli (buzzers) that had been paired repeatedly with electric shocks, and (3) exhibited poorer passive avoidance learning in a "mental maze" task that required participants to learn a complicated series of lever presses, some of which were surreptitiously "baited" with electric shock. These seminal psychometric and laboratory findings were replicated and extended by a number of investigators (for reviews, see Hare, 1978; Lorber, 2004). In his later writings, Lykken (1995) argued that earlyemerging fearlessness gives rise to all the other core features of psychopathy, including lack of guilt, dishonesty, poor impulse control, and failure to learn from punishment. This conjecture is in part consistent with research (Kochanska, Aksan, & Joy, 2007) demonstrating that low fear in children, as assessed by their reaction to novel stimuli in a laboratory setting, predicts and perhaps contributes to weaker levels of conscience in later development.

Following up Lykken's classic laboratory work, Hare (1965) developed a "countdown" procedure in which psychopathic and nonpsychopathic participants observed a memory drum displaying numbers decreasing from 10 to 0; when the drum reached 0, participants received a painful electric shock. In several studies (Hare, 1978; Lorber, 2004), some of which used an aversive noise in lieu of cutaneous shock, psychopaths displayed significantly lower electrodermal (skin conductance) activity in anticipation of the aversive stimulus compared with nonpsychopaths, although not necessarily to the stimulus itself. In addition, they displayed what Hare (1965) termed a "steep temporal gradient of fear arousal," which means that they exhibited pronounced increases in electrodermal activity only immediately preceding the aversive stimulus. These findings broadly dovetail with those of Lykken (1957) in suggesting diminished levels of fear propensity in psychopathic individuals.

#### Historical Origins of the Boldness Construct

The notion that psychopathy is associated with a paucity of social and, to a lesser extent physical, fear has a lengthy history. In *The Mask of Sanity*, Cleckley (1941/1976) described the prototypical psychopath as a chimera, a hybrid creature whose superficially agreeable persona conceals a darker, affectively impoverished interior. Cleckley especially underscored the extent to which psychopaths' interpersonal poise can be deceptive:

More often than not, the typical psychopath will seem particularly agreeable and make a distinctly positive impression when he is first encountered. Alert and friendly in his attitude, he is easy to talk with and seems to have a good many genuine interests. There is nothing at all odd or queer about him, and in every respect he tends to embody the concept of a well adjusted, happy person. . . . He looks like the real thing. (p. 339)

As noted earlier, Patrick (2006; see also Chapter 1, this volume) argued that boldness maps largely onto what Cleckley described as the "mask" of superficially healthy adjustment (but see Miller & Lynam, 2012, for a dissenting view), a conjecture borne out by the aforementioned survey results of Crego and Widiger (2016). Patrick (2006) maintained that four of Cleckley's 16 criteria, namely, superficial charm and good "intelligence," absence of anxiety and other neurotic manifestations, relative immunity from suicide attempts or completions, and failure to learn from experience (reflecting, according to Cleckley's description, a failure to learn from punishment), map especially well onto the boldness construct. Moreover, noteworthy elements of boldness can be found in several of Cleckley's other criteria for psychopathy. For example, when describing "untruthfulness and insincerity," Cleckley wrote of psychopathic individuals' "ease and unpretentiousness in making a serious promise," observing that they are "apparently unperturbed" when telling blatant lies and have "no difficulty at all in looking anyone tranquilly in the eyes" (p. 341). Similarly, in his description of "unresponsiveness in general interpersonal relations," Cleckley wrote of psychopaths' "outward social graces," observing that "they come easily" to most of these individuals (p. 355). Striking references to elements of the boldness construct can also be found in Cleckley's other-and regrettably, largely ignored-writings on psychopathy. For example, in case descriptions not explicitly discussed in the The Mask of Sanity, Cleckley (1946) wrote that "usually and typically, he [the psychopath] is polite, affable, and impressive" (p. 22). Speaking of the modal psychopath's life successes, he observed further that he frequently will have "outstripped 20 rival salesmen over a period of 6 months, or married the most desirable girl in town, or, in a first venture into politics, got himself elected into the state legislature" (p. 22).

Cleckley (1941/1976) was not alone in his descriptions of psychopathic individuals as characterized by deficient social and physical fear, venturesomeness, and resilience in the face of stressors. For example, in their classic writings on the construction of the MMPI Psychopathic Deviate scale, McKinley and Hathaway (1944) noted that individuals with elevated scores on this scale are "often characterized by a relatively appealing personality," and that their superficial psychological health is "misleading to clinicians so that a halo effect operates toward too lenient a view of the clinical problem" (p. 173). Further anticipating the concept of boldness are the following scholarly contributions:

- The classic theoretical writings of Karpman (1941), who distinguished "primary" (genuine) psychopathy, which is marked by low levels of anxiety and a failure to benefit from punishing experiences, from "secondary" psychopathy (pseudopsychopathy), which entails high levels of anxiety and neurotic conflict.
- 2. The theoretical and empirical writings of Lykken (1957, 1982) on fearlessness, as noted earlier.
- 3. The theoretical writings of Quay (1965) on low levels of tonic physiological arousal and

propensities toward excitement seeking in psychopathy.

4. The work of Gray (1982) and Fowles (1980) linking low activity of the behavioral inhibition system (a brain-based system comprising the septum, hippocampus, orbitofrontal cortex, and amygdala, among other structures) to primary psychopathy (see Patrick & Drislane, 2015, for a further discussion of the historical antecedents of the boldness construct).

Boldness is also represented in several contemporary operationalizations of psychopathy. For example, Miller, Lynam, Widiger, and Leukefeld (2001) developed a psychopathy prototype derived from expert ratings of five-factor model (FFM) personality traits. This prototype clearly incorporates important elements of boldness, including (1) low scores on several Neuroticism facets, such as anxiety, self-consciousness, and vulnerability; (2) high scores on several Extraversion facets, especially those relevant to "agentic" or "surgent" components of Extraversion (see Tellegen & Waller, 2008), such as assertiveness, excitement seeking, and gregariousness; and (3) one facet of Openness to Experience, namely, actions (see Lilienfeld et al., 2015b; Lynam & Derefinko, 2006). More recently, boldness appears to feature prominently in the new DSM-5 Section III psychopathy specifier for antisocial personality disorder (ASPD), which consists of summed scores on facet traits of low anxiousness, low social withdrawal, and high attention seeking (American Psychiatric Association [APA], 2013)-for example, as operationalized by the Personality Inventory for DSM-5 (PID-5; Krueger, Derringer, Markon, Watson, & Skodol, 2012). Although this psychopathy specifier has been criticized for an overreliance on reversecoded items (Crego & Widiger, 2014), it correlates moderately to highly with established indicators of boldness, such as PPI FD and the Boldness scale of the Triarchic Psychopathy Measure, an influential new psychopathy inventory to be discussed later (e.g., Anderson, Sellbom Wygant, Salekin, & Krueger, 2014; Few, Lynam, Maples, MacKillop, & Miller, 2015).

## The Nomological Network Surrounding Boldness

The past decade has witnessed a proliferation of research on the correlates of boldness. This work has clarified the nomological network surrounding this construct, while raising provocative questions regarding its fundamental nature and its relevance to psychopathy (see also Patrick & Bernat, 2009).

#### Boldness and Relations with General Psychopathology

In their original article on the factor-analytic derivation of the PPI higher-order dimensions, Benning and colleagues (2003) reported that FD and SCI displayed strikingly different psychopathological correlates. Specifically, they found that that only SCI was associated significantly with various indices of substance and drug abuse; this dimension, unlike FD, was also consistently positively associated with a host of measures of childhood and adult antisocial behavior. In contrast, FD was essentially unrelated to childhood antisocial behavior, although it was slightly but significantly associated with interview-assessed adult antisocial behavior (r = .15). In a later series of studies using community twin, student, and inmate samples, Benning, Patrick, Blonigen, and colleagues (2005) reported that FD, as estimated by scores on the lower-order trait scales of the Multidimensional Personality Questionnaire (Tellegen & Waller, 2008), a well-validated measure of normal-range personality traits, was significantly and negatively associated with measures of social phobia (social anxiety disorder), other phobic fears, and depression, and positively associated with measures of narcissism.

A meta-analysis of 61 studies by Miller and Lynam (2012) clarified the psychopathological correlates of FD as assessed by the PPI and the PPI-R. They found that FD was moderately and negatively associated with conditions marked by internalizing symptoms ( $r_w = -0.34$ ), including anxiety and mood symptoms. Corroborating the findings of Benning and colleagues (2003), FD was largely or entirely unassociated with externalizing symptoms, including aggression, antisocial behavior, and substance use, although the associations with antisocial behavior and substance abuse were statistically significant (r's = .12 and .07, respectively). With respect to Cluster B (dramatic, emotional) personality disorders, FD was significantly correlated with symptoms of ASPD, although this relationship was small in magnitude at best (r =.07); FD was significantly and moderately correlated with features of narcissistic personality disorder (NPD; r = .37) and significantly and negatively correlated with features of borderline personality disorder (BPD; r = -.17).

Taken together, these studies paint a picture of FD as being negatively associated with conditions marked by emotional distress, and positively associated with healthy adjustment. On the more negative side, FD is also tied to high levels of narcissism and NPD traits. In contrast to SCI, the associations between FD and both global antisocial behavior and substance abuse tend to be weak, or at best modest (e.g., see Hicks et al., 2013), at times failing to attain conventional levels of statistical significance.

#### Boldness and Its Relations with Psychopathy and ASPD

The relationship of boldness to other psychopathy constructs is complex and often inconsistent across measures. On the one hand, PPI/PPI-R FD tends to be only weakly related to total scores on the PCL-R (Hare, 1991/2003), a largely interviewbased measure that is probably the best validated measure of psychopathy. FD is modestly associated with scores on PCL-R Factor 1 ( $r_w = .23$ ), which assesses the core interpersonal and affective features of psychopathy, but is largely unassociated with scores on PCL-R Factor 2 ( $r_w = .07$ ), which assesses the antisocial lifestyle features of psychopathy (Miller & Lynam, 2012; see also Marcus et al., 2013). Nevertheless, when one drills down more deeply to the four-facet level of the PCL-R, a more nuanced picture emerges. Specifically, across several studies, FD has been largely unassociated with three of the four facets of the PCL-R, but is associated consistently and moderately with the Interpersonal facet, which comprises superficial charm, glibness, and a grandiose sense of self-worth (e.g., Hall et al., 2014; Venables, Hall, & Patrick, 2014; Wall, Wygant, & Sellbom, 2014).

A meta-analysis by Marcus and colleagues (2013) revealed that FD displayed similarly low associations across 10 studies with both factors of the Levenson Self-Report Psychopathy Scale (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995), a widely used self-report measure of psychopathy modeled largely after the PCL-R. By contrast, Marcus and colleagues found that across five studies, FD was highly associated with Factor 1 ( $r_w = .53$ ) and moderately to highly associated with Factor 2 ( $r_{\rm m}$ = .40) of the Hare Self-Report Psychopathy Scale (SRP; Paulhus, Neumann, & Hare, 2014), another self-report measure modeled after the PCL-R. The most parsimonious explanation for these discrepancies is that whereas the PCL-R and LSRP are only weakly or at best moderately saturated with boldness, the SRP is substantially saturated with boldness (Drislane, Patrick, & Arsal, 2014; Lilienfeld, Watts, & Smith, 2015a; Patrick & Drislane, 2015), thereby engendering substantial correlations with FD.

As Miller and Lynam (2012) demonstrated in their meta-analysis, FD is at best weakly associated with ASPD features. This finding is perhaps not surprising given that ASPD is associated with a longstanding history of antisocial and criminal behavior, and is therefore almost invariably maladaptive. As noted earlier, the results of two recent studies (Venables et al., 2014; Wall et al., 2015) demonstrate that boldness is a primary, if not the primary feature differentiating psychopathy, as measured by the PCL-R, from ASPD (see also Murphy, Lilienfeld, Skeem, & Edens, 2016). These findings dovetail with the longstanding historical view that psychopathy is more associated with adaptive functioning, including superficial charm, dominance, and psychologically healthy risk-taking, than is ASPD (Lilienfeld et al., 2015a). These findings also comport with the inclusion of the recently introduced psychopathy specifier for ASPD in Section III of DSM-5 (APA, 2013), which, as discussed earlier, is highly associated with measures of boldness (Anderson et al., 2014; Few et al., 2015).

The results of a more recent meta-analysis paint a quite different picture of the psychopathy-related correlates of boldness, and further flesh out the nomological network of this construct. Lilienfeld, Smith, and colleagues (2016) examined the associations between various operationalizations of boldness and scores on non-PCL-based measures of psychopathy. They hypothesized that because the PCL and PCL-R were developed with and validated on prison samples, they would be less likely than other psychopathy measures to capture potentially adaptive features of psychopathy, especially boldness. Specifically, Lilienfeld and colleagues examined the association between boldness and 11 non-PCL-based measures of psychopathy across 32 samples (N = 10,693). They found a considerably higher mean effect size (r =.38) than reported in either of the two prior boldness meta-analyses (Marcus et al., 2013; Miller & Lynam, 2012); when the analyses were restricted to well-validated psychopathy measures, the mean effect size rose to r = .44. Moreover, these statistical effects, which were medium to large in magnitude, were not limited to one psychopathy measure. Specifically, the correlations ranged from r = .38 to .57 for five non-PCL-based measures, namely, the DSM-5 Psychopathy Specifier, the Elemental Psychopathy Assessment (EPA; Few, Miller, & Lynam, 2013), the Psychopathy Resemblance Index (PRI; Miller et al., 2001), the Youth Psychopathic Traits Inventory (Andershed, Kerr, Stattin, & Levander, 2002), and the interviewbased Comprehensive Assessment of Psychopathic Personality (CAPP; Cooke & Logan, Chapter 9, this volume). These results strongly suggest that boldness is relevant to a number of well-validated psychopathy measures, especially those developed for use with nonforensic populations (see also Berg, Lilienfeld, & Sellbom, 2017, for survey data indicating that researchers and practitioners perceive boldness as relevant to psychopathy).

#### **Boldness and Normal-Range Personality**

In two of the meta-analyses already discussed, Miller and Lynam (2012) examined the correlates of PPI FD within the prism of the FFM (Costa & McCrae, 1992), and Marcus and colleagues (2013) examined the correlates of PPI FD within the prism of the three-factor model of personality (Tellegen & Waller, 2008). Miller and Lynam (2012) reported that FD was associated primarily with (reversed) FFM Neuroticism ( $r_w = -.50$ ), FFM Extraversion ( $r_w = .50$ ), and, to a lesser extent, FFM Openness to Experience ( $r_w = .25$ ); associations with FFM Agreeableness and Conscientiousness were negligible. Consistent with the conjectures of Fowles (1980) and Lykken (1995), FD was highly and negatively associated with measures of behavioral inhibition ( $r_w = -.57$ ). Its associations with measures of behavioral activation were weaker but nonetheless positive and moderate positive in magnitude ( $r_w = .35$ ). Broadly corroborating Miller and Lynam's results, Marcus and colleagues (2013) reported that FD was correlated with Positive Emotionality ( $r_w = .39$ ) and (reversed) Negative Emotionality ( $r_w = -.35$ ), but essentially uncorrelated with Constraint ( $r_w = -.04$ ). Marcus and colleagues also found that FD was highly associated with sensation seeking ( $r_w = .51$ ; see Lynam & Miller, 2013, for similar findings).

In aggregate, data on the relations between boldness and normal-range personality traits indicate that measures of this construct are associated with high levels of extraversion and positive emotionality, and low levels of neuroticism and negative emotionality (Lynam & Miller, 2013; Miller et al., 2001). In addition, boldness is consistently, although only moderately, associated with Openness to Experience, most likely attributable to the inclusion of content assessing novelty seeking within the openness construct (Lilienfeld et al., 2015b). These findings again suggest that boldness, as assessed by FD and cognate indicators, is tied largely to psychologically adaptive functioning, as well as to risk taking (see Lilienfeld et al., 2015a, for a review).

#### Boldness and Interpersonal Behavior

Several investigative teams have begun to explore the implications of boldness for interpersonal behavior that is often associated with adaptive qualities, including leadership and heroism (Lilienfeld et al., 2015a). To examine the relationship between boldness, as assessed by FD, and political leadership, Lilienfeld, Waldman, and colleagues (2012) asked 121 presidential biographers and other experts to rate the 42 U.S. presidents, up to and including George W. Bush, on their pre-office personality traits using a measure of the NEO-PI-R (Costa & McCrae, 2008), a widely used measure of the FFM. They then obtained estimates of presidents' PPI-related psychopathic traits by using previously validated formulas for predicting these traits from normal-range personality dimensions (see Ross et al., 2009). The experts' ratings of the presidents' FD scores displayed moderate to high interrater reliability.

Using generalized estimated equations to account for the nesting of raters within presidents, Lilienfeld, Waldman, and colleagues (2012) then compared these presidential personality ratings with the results of several large-scale polls of presidential performance completed by well-known historians (e.g., the 2009 C-SPAN Poll of Presidential Performance, the 2010 Siena College Poll) and largely objective indicators of presidential performance. They found that FD was significantly associated not only with historians' ratings of overall presidential performance but also with independently rated leadership, public persuasiveness, communication ability, and willingness to take risks. FD was also associated with initiating new legislation, winning elections by a landslide, and being viewed as a world figure. Interestingly, FD was associated positively with assassination attempts, perhaps because bolder presidents tend to be willing to make enemies if necessary.

Theodore ("Teddy") Roosevelt, variously nicknamed "The Lion," "The Happy Warrior," "The Dynamo of Power," "The Driving Force," and the "Cyclone Assemblyman" (the latter from his days as New York State assemblyman) scored highest on FD. Interestingly, however, Roosevelt's scores on other features of psychopathy, such as SCI, were not markedly elevated, perhaps helping to explain why he was a highly successful politician. One fellow New York Assemblyman vividly recalled the first time he met Roosevelt: "He came in as if he had been ejected by a catapult" (Goodwin, 2013, p. 68). In contrast, Roosevelt's immediate successor, William Howard Taft, nicknamed "The Reluctant President," brought up the rear on FD. Although the differences among Presidents' FD levels must be qualified by the fact that trait ratings were derived from only a few informants for each leader, many of these differences were supported by circumstantial historical evidence. For example, in her book on Roosevelt and Taft, The Bully Pulpit: Theodore Roosevelt, William Howard Taft, and the Golden Age of Journalism, Princeton University historian Doris Kearns Goodwin (2013) highlighted the sharp differences in personality and leadership style between these two chief executives. One example is especially illustrative. Writing of Roosevelt's advice to Taft during the 1908 presidential election pitting Taft against Williams Jenning Bryan, Goodwin wrote that "fearing that Taft would be too reticent on the stump, Roosevelt barraged him with incessant advice. 'Do not answer Bryan; attack him. . . . Don't let him make the issues'" (p. 553).

Preliminary research from our laboratory has further elucidated the implications of boldness for workplace behavior and leadership (Smith & Lilienfeld, 2012; Smith, Watts, & Lilienfeld, 2017). In a sample of 312 North American community members recruited using Amazon Mechanical Turk, PPI-R FD was positively associated with adaptive leadership styles (e.g., transformational leadership) and minimally related to counterproductive workplace behaviors (e.g., stealing from the company) and maladaptive leadership styles (e.g., being domineering or abusive to subordinates). In addition, in a large (N = 3,388) Internet survey of members of the general population across multiple countries, Lilienfeld, Latzman, Watts, Smith, and Dutton (2014) found that FD, as estimated from a short form of the PPI-R, was modestly and positively associated with the number of both leadership and management positions held; it was also positively associated with holding risky occupations, such as police, fire, and military work. The effect sizes for these findings were in the small to medium range.

Following up on Lykken's (1995; see also Lykken, 1982) conjecture that the "the hero and the

psychopath may be twigs on the same genetic branch" (p. 181), linked together by low levels of dispositional fear, Smith, Lilienfeld, Coffey, and Dabbs (2013) examined the relationship between PPI-assessed psychopathy and what they termed "everyday heroism." To assess heroism, which was conceptualized as altruism associated with social or physical risk, they administered a questionnaire to assess the frequency with which individuals engaged in a variety of heroic behaviors that are reasonably common in real-world settings-such as assisting a stranded motorist, administering cardiopulmonary resuscitation to a collapsed individual, and attempting to break up a fight in public. Participants also completed a measure of altruistic behavior subdivided into two subscales, namely altruism toward charities and altruism toward strangers. Across several undergraduate and community samples, Smith and colleagues found that, generally, PPI FD was positively, albeit weakly to moderately, associated with heroism and altruism toward strangers, suggesting that a predisposition toward fearlessness and a willingness to take risks may contribute to heroism.

In a second part of the study, Smith and colleagues (2013) examined the relation between psychopathy and an ostensibly more objective indicator of heroism-war heroism among the 42 U.S. Presidents using the same methodology described earlier. As predicted, they found that estimated FD scores were positively associated with presidential war heroism. The presidential war heroes included Theodore Roosevelt and Zachary Taylor, both of whom scored well above the mean on FD. These findings, although promising, need to be extended to other samples, especially those marked by high levels of occupational heroism, such as police officers, firefighters, and soldiers. Nevertheless, Smith and colleagues' findings imply that boldness is linked distinctively to prosocial behavior that is potentially risky rather than to prosocial behavior in general.

#### Summary

Data collected over the past decade have helped to inform the nomological network surrounding boldness. Studies demonstrate that this construct is a composite of scores on several traits, especially "surgent" or "agentic" extraversion, emotional stability, and, to a lesser extent, the novelty-seeking component of openness to experience (but more so risky sensation seeking; Benning, Patrick, Blonigen, et al., 2005; Marcus et al., 2013). High levels of boldness are also associated with diminished risk for features of distress-related psychopathology, especially mood and anxiety disorders, and BPD; at the same time, they are tied to a heightened risk for NPD. Recent work suggests that boldness is relevant to potentially adaptive forms of interpersonal behavior, including leadership and heroism.

## **Criticisms of the Boldness Construct**

Despite the accumulating evidence for its relevance to at least some influential conceptualizations of psychopathy, the boldness construct has not been immune to criticism. We address two principal criticisms here.

#### Factorial Coherence of Fearless Dominance

First, some authors have argued that the higherorder dimension of FD, at least as derived from the PPI and PPI-R, lacks factorial coherence. Specifically, some factor analyses of the PPI subscales have failed to replicate Benning and colleagues' (2003) factor structure, and have not obtained satisfactory model fit for the FD factor (e.g., Neumann, Malterer, & Newman, 2008; Smith, Edens, & Vaughn, 2011). This suboptimal fit derives largely from the fact that two of the three PPI subscales traditionally loading onto FD, namely, Fearlessness and Stress Immunity, frequently exhibit substantial cross-loadings on the SCI higher-order dimension (Fearlessness: positive; Stress Immunity: negative). This lack of stringent factor-analytic fit is perhaps unsurprising given that the PPI was not initially developed to yield a higher-order factor structure, which emerged only in post hoc analyses of the PPI subscales (Benning et al., 2003; Lilienfeld, 1990). Moreover, as several authors have observed, the reliance on traditional stringent criteria for fit in confirmatory factor-analytic (CFA) models is probably unrealistic for many or most personality measures, which tend to include many multiply determined items (Hopwood & Donnellan, 2010). In particular, because many of the items (and subscales) comprising boldness reside in interstitial factor space, falling between major dimensions of personality (e.g., low neuroticism, high surgentextraversion), it is perhaps not surprising that measures of boldness often fail to display adequate levels of fit in CFA models.

In part to allay concerns regarding the questionable factorial coherence of PPI-derived FD, Patrick (2010) developed the Triarchic Psychopathy Measure (TriPM), which operationalizes the three constructs of the "triarchic model" of psychopathy (Patrick et al., 2009): boldness, disinhibition, and meanness. In many respects, the TriPM scales can be viewed as reflecting a bootstrapping (see Cronbach & Meehl, 1955) of the original PPI higherorder dimensions into what are ideally more factorially pure indices. In this respect, the Boldness scale may help to address criticisms of the heterogeneity of FD. Preliminary work suggests that the TriPM Boldness scale is correlated highly with PPI/PPI-R FD, and displays an extremely similar set of external correlates to FD (Sellbom & Phillips, 2013; Stanley, Wygant, & Sellbom, 2012; see also Kramer, Patrick, Krueger, & Gasperi, 2012, for data on the correlations between boldness indicators and a latent fearlessness dimension).

#### Relevance of Boldness to Psychopathy

Second, several authors have contended that boldness is of questionable relevance to psychopathy (Lynam & Miller, 2013; Miller & Lynam, 2012; Neumann, Uzieblio, Crombez, & Hare, 2013). Specifically, they have argued that this dimension is of dubious importance to personality pathology, including psychopathy, based on findings (including those reviewed earlier) indicating that PPI FD is (1) only modestly associated with scores on the two major PCL-R factors, (2) negligibly associated with measures of externalizing (e.g., antisocial) behavior, and (3) associated largely or entirely with adaptive functioning. According to these authors, boldness is perhaps best conceptualized as a "specifier" for psychopathy (i.e., a moderator of its behavioral expression), one that distinguishes more successful from less successful individuals with this condition. Nevertheless, they contend that it is not inherently part of psychopathy itself. Notably, the view that boldness should be a specifier for psychopathy is broadly consistent with DSM-5's (APA, 2013) inclusion of an ASPD psychopathy specifier, which, as noted earlier, correlates moderately to highly with measures of boldness, including PPI-R FD.

In response to these criticisms, Lilienfeld, Patrick, and colleagues (2012; see also Crego & Widiger, 2015, 2016; Patrick & Drislane, 2015) noted that key elements of the construct of boldness, including social poise, charm, venturesomeness, fearlessness, and immunity to anxiety, can be found in numerous classic writings on psychopathy (e.g., Cleckley, 1941/1976; Henderson, 1939; Lykken, 1957; McKinley & Hathaway, 1944). These authors also noted that PPI-assessed FD (1) distinguishes primary from secondary psychopathy in cluster-analytic studies (Hicks, Markon, Patrick, Krueger, & Newman, 2004), and (2) is moderately to highly associated (rs in the .4 to .6 range) with total scores on several well-validated self-report psychopathy measures, including the EPA (Few et al., 2015), PRI (Ross et al., 2009) and, as noted earlier, the SRP (Marcus et al., 2013). Indeed, these moderate to high correlations were corroborated in the boldness meta-analysis described earlier (Lilienfeld, Watts, & Smith, 2016). Nevertheless, given that boldness measures are not strongly associated with the PCL-R or its lower-order dimensions, the precise role of boldness within the broader construct of psychopathy requires clarification. We return to this issue in the chapter's concluding section.

#### Maladaptive Features of Boldness

The criticisms of Miller and Lynam (2012; see also Lynam & Miller, 2013) raise the important question of whether boldness is purely adaptive or whether it is also tied to maladaptive correlates, either alone or in conjunction with other variables. Although extant data do not permit a clear-cut answer to this question, they offer several clues.

#### **Zero-Order Associations**

As noted earlier, boldness measures tend to be positively correlated with measures of antisocial behavior, including aggression, although the magnitude of this association is at best modest (Lynam & Miller, 2013). Nevertheless, this modest association may in part reflect the fact that aggression is highly heterogeneous. Indeed, in an undergraduate sample, Hecht, Berg, Lilienfeld, and Latzman (2016) found that FD scores derived from the PPI-R were positively, albeit only modestly (r =.15), associated with proactive aggression, whereas they were essentially independent (r = .04) of reactive aggression. These findings raise the possibility that FD contributes selectively to planned and largely unprovoked aggression that is committed in the absence of potent negative emotion.

To further examine the possibility that boldness has a "dark side," we recently conducted a focused meta-analysis of the relation between PPI and PPI-R FD and sexual risk taking (Lilienfeld, Watts, & Smith, 2016). We selected sexual risk taking as a target variable given that the ability to initiate sexual interactions presumably often requires a modicum of social boldness, novelty seeking, and a devil-may-care attitude (Hoyle, Fejfar, & Miller, 2000), propensities that are especially marked among individuals with elevated boldness. We identified four studies of undergraduates or community members (Fulton, Marcus, & Payne, 2010; Fulton, Marcus, & Zeigler-Hill, 2014; Kastner & Sellbom, 2012; Marcus & Norris, 2014) who received either the Sexual Risk Survey (Turchik & Garske, 2009) or the Sociosexual Orientation Inventory (Simpson & Gangestad, 1991), two wellvalidated self-report indices of sexual risk taking that include behaviors such as sexual intercourse without a condom and intercourse while intoxicated. Additionally, we used two other existing datasets collected by our laboratory and the laboratory of Robert Latzman of Georgia State University (one of the authors of this chapter).

We found that all three PPI higher-order dimensions were associated with sexual risk taking, with the relationship for FD being small to medium in magnitude (r = .21) using Cohen's (1988) provisional metrics, and the association with SCI being medium in magnitude (r = .31). Although these findings raise the possibility that FD is tied modestly to risky and potentially maladaptive outcomes in the sexual domain, they should be interpreted in light of two caveats. First, the number of studies was small, and replication in other samples, especially more severely affected samples that may be marked by high levels of sexual risk taking (e.g., prison samples), will be necessary to corroborate these results. Second, the small to medium correlation between FD and risky sexual behavior could be attributable at least in part to the small amount of shared variance between FD and SCI. Indeed, Fulton and colleagues (2014) found that controlling statistically for SCI scores reduced the association between FD and sexual risk taking to nonsignificance. Hence, further studies of incremental validity will be needed to exclude the possibility that the association between boldness measures, including FD, and sexual risk taking reflects the "piggybacking" of this psychopathy dimension atop other psychopathy dimensions, especially those assessing impulsive-irresponsible tendencies.

#### **Curvilinear Associations**

In a provocative theoretical and empirical review, Grant and Schwartz (2011) argued that many psychological characteristics exhibit inverted U- shape associations with other variables, such that medium levels of such characteristics are related to adaptive outcomes, but extremely high levels are associated with maladaptive outcomes. For example, these authors cited research suggesting that optimism and self-esteem, although healthy in moderate doses, appear to be tied to adverse outcomes, such as unwise risk taking and lower levels of learning, at very high levels. Although data reported earlier suggest that extremely low levels of boldness are tied to elevated risk for internalizing disorders (e.g., Lynam & Miller, 2012), it remains unclear whether boldness becomes similarly maladaptive when it attains extremely high levels. In their study of U.S. Presidents reported earlier, Lilienfeld, Waldman, and colleagues (2012) found no consistent evidence for curvilinear effects of FD on any measures of presidential performance. Nevertheless, these negative findings must be interpreted cautiously in light of the small sample size (N = 42) and potentially restricted range of scores (especially at the high end) on boldness. Given these uncertainties, we call for further investigation of curvilinear effects for boldness in extant and newly collected datasets.

#### Statistical Interactions of Boldness with Self-Centered Impulsivity

One intriguing possibility is that boldness is rarely malignant by itself, but it becomes malignant in the presence of other traits, especially SCI. Indeed, what Tom Wolfe (1979) described as the "right stuff' may reflect the conjunction of boldness with largely intact executive functioning (Lilienfeld et al., 2015a; Lilienfeld, Watts, & Smith, 2016). In contrast, when boldness is conjoined with poor executive functioning, it may be channeled (for a broader discussion of the channeling of motives, see Frost, Ko, & James, 2007; James, 2008) into ill-conceived risk taking, giving rise to the "poor judgment" (p. 345) that Cleckley (1941/1976) described as emblematic of psychopathy. In this vein, some authors have reported significant statistical interactions of a potentiating form between FD and SCI in relation to clinically relevant outcomes, such as predatory aggression (Smith, Edens, & McDermott, 2013), sexual risk taking (Kastner & Sellbom, 2012), and negative affect (e.g., guilt, shame) following risky sexual behavior (Fulton et al., 2014). In contrast, Maples and colleagues (2013) found scant evidence for statistical interactions between FD and SCI in predicting scores on over 20 external criteria, including indices of antisocial behavior, substance use, or pathological gambling. Although the FD × SCI interaction did account for a statistically significant, albeit small (2%) amount of the variance in narcissism scores, replication of this finding will be necessary.

The evidence at present is too preliminary and susceptible to potential "file drawer effects" (whereby nonsignificant interactive findings remain unpublished; see Rosenthal, 1979) to draw firm conclusions regarding the interactional hypothesis. Hence, further investigation of potential statistical interactions between FD and other dimensions of psychopathy is clearly warranted.

#### Suppressor Effects

In recent work with data from a large (N = 1,661)sample of offenders, Watts and colleagues (2016) examined the statistical effects of controlling for social desirability response style scores (assessed using several well-validated indicators of social desirability, such as the PPI Unlikely Virtues scale) on the relationship between PPI FD and maladaptive outcomes, including indices of antisocial behavior (e.g., symptom counts of ASPD, PCL-R Factor 2 scores, PCL-R Total scores). For 18 of 18 outcomes examined, they found statistically significant suppressor effects (see Conger, 1974) of modest magnitude, whereby the relations between FD and the outcome variable became more pronounced after controlling statistically for social desirability scores. Watts and colleagues proposed that the most parsimonious interpretation of this finding is that removing psychologically adaptive variance from boldness, especially elements of low neuroticism, high agreeableness, and high conscientiousness (see Holden & Passey, 2010, for evidence that social desirability scales are heavily saturated with scores on these three FFM dimensions), fundamentally leaves only the maladaptive features of this dimension remaining. If so, Watts and colleagues' results suggest that measures of boldness indeed contain maladaptive variance, but that this variance is largely obscured by the adaptive variance in this construct.

#### Summary

The intriguing question of whether boldness is characterized by an unappreciated "dark side" remains unresolved and requires further investigation. Nevertheless, preliminary evidence raises the possibility that this dimension is modestly associated with sexual risk-taking behaviors and proactive aggression, and that it may sometimes (but see Maples et al., 2013) potentiate high levels of SCI in contributing to risk for maladaptive behaviors. With respect to the latter hypothesis, further work should investigate the intriguing hypothesis that boldness can be channeled into either adaptive (e.g., heroism) or maladaptive (e.g., criminality) outcomes depending on executive functioning, impulsive tendencies, and related individual differences (see Harkness & Lilienfeld, 1997, for a broader discussion). Finally, further research is needed to test for the possibility of curvilinear relations between FD and maladaptive outcomes, and of suppressor effects arising from the removal of adaptive variance from this dimension (e.g., Watts et al., 2016).

## Boldness and the Syndromal Status of Psychopathy

The finding that PPI FD is only weakly or at best modestly associated with PPI SCI and Coldheartedness (Marcus et al., 2013; Miller & Lynam, 2012) has understandably struck some commentators as anomalous. This finding seems difficult to reconcile with the assumption that psychopathy is a classical syndrome (Crego & Widiger, 2014), that is, a condition characterized by a set of signs and symptoms that covary across individuals (Kazdin, 1983; Lilienfeld, Waldman, & Israel, 1994). This assumption appears to be widely held in the psychopathy literature. For example, Hare (1993) wrote that "psychopathy is a syndrome-a cluster of related symptoms" (p. 34; emphasis added). Nevertheless, the assertion that psychopathy is syndromal is challenged by findings that (1) the lower-order and higher-order dimensions of several well-validated self-report psychopathy measures, including the PPI/PPI-R (Lilienfeld & Andrews, 1996) and at least one other self-report psychopathy measure, namely, the EPA (see Few et al., 2013), do not display a consistent pattern of positive manifold (i.e., uniformly positive interrelations among subscales); and (2) two major factors of the and PPI and PCL-R show opposing associations with measures of internalizing psychopathology. For the PCL-R, such divergence is not invariably evident at the level of zero-order correlations, but it becomes clear when the covariance of the two major dimensions is statistically controlled (Blonigen et al., 2010).

To explain this paradox, we (Lilienfeld, 2013; Lilienfeld & Fowler, 2006) proposed that Cleckley's psychopathy is what industrial/organizational psychologists term a "compound variable," that is, a constellation of largely independent subtraits that combine to form a meaningful trait complex (Berry, Sackett, & Wiemann, 2007). Compound variables, also called "emergent traits" (Hough & Schneider, 1996), differ from "multifaceted variables," whose constituent features are subcomponents of a higher-order construct (Smith, Fischer, & Fister, 2003). In the case of psychopathy, what Cleckley (1941/1976) dubbed the "mask of sanity" may be a conjunction of at least two strikingly different attributes: (1) the outward appearance of seemingly healthy adjustment ("the mask"), marked largely by boldness, conjoined with (2) poor impulse control and profound deficits in guilt, empathy, and social connectedness, marked largely by PPI SCI and Coldheartedness (Lilienfeld, 2013).

From this perspective, boldness alone is necessary but insufficient for the full clinical picture of psychopathy. Hence, such individuals as Michael Harari and Theodore Roosevelt, who appear to have possessed elevated levels of boldness but not other core features of psychopathy, would not be considered "psychopathic." This configural hypothesis dovetails broadly with "dual process" models of psychopathy (Dindo & Fowles, 2011; Patrick & Bernat, 2009), which conceive of psychopathy as reflecting the confluence of two etiologically disparate processes, namely boldness and disinhibition, the latter often conjoined with social detachment (see also Patrick & Drislane, 2015).

If this analysis has merit, the correct answer to the vexing question of whether psychopathy is a syndrome is that "it depends on one's conceptualization of psychopathy." If one is referring to ASPD and related conceptions of largely "unsuccessful" psychopathy that emphasize the roles of disinhibition and profound affective detachment from others, psychopathy is indeed syndromal. This is because the lower-order traits within each of these two dimensions, and the two dimensions themselves, are positively intercorrelated. With respect to interrelatedness at the broader dimensional level, the notion of a pronounced degree of covariation between impulsivity and callousness dates back at least to the classic work of Eysenck (Eysenck & Eysenck, 1975), whose (inaptly named) "Psychoticism" dimension reflects the nexus of these two traits (Goldberg & Rosolack, 1994). In contrast, if one is instead referring to Cleckley's psychopathy, and the allied conceptions of largely "successful" psychopathy that underscore the role of boldness as a key feature of this phenotypic entity, psychopathy is not a classical syndrome because boldness is largely unrelated to other key features of psychopathy (Marcus et al., 2013).

As we discussed earlier, the question of whether boldness is relevant to psychopathy has recently become a source of contention in the literature, with some authors (e.g., Lilienfeld, Patrick, et al., 2012; Patrick et al., 2013) maintaining that it directly reflects the veneer of seemingly adaptive functioning described by Cleckley (1941/1976), and others (e.g., Lynam & Miller, 2013; Miller & Lynam, 2012) arguing that it is irrelevant or at best peripheral to psychopathy. In support of the former position are data, mentioned earlier, that PPI-R FD and TriPM Boldness scores are highly correlated (r's typically between .5 and .6) with scores on two measures that capture prototypical psychopathy, the PRI and the EPA (e.g., Poy, Segarra, Esteller, López, & Moltó, 2014; Wilson, Miller, Zeicher, Lynam, & Widiger, 2011). Moreover, as also noted earlier, Venables and colleagues (2014) reported that TriPM boldness was the primary triarchic model variable differentiating psychopathy from ASPD (see also Wall et al., 2015).

Broadly consistent with the traditional notion of psychopathy as entailing two distinct "faces," boldness may also help to distinguish between more successful and less successful psychopathy (Hall & Benning, 2006). In a survey of clinical psychology professors and psychologists interested in legal issues along with lawyers, Mullins-Sweatt, Glover, Derefinko, Miller, and Widiger (2010) assembled a prototype of the successful psychopath using the 30 facets of the NEO-PI-R. They found that the prototypical successful psychopath was marked by high scores on Assertiveness, Activity, and Excitement Seeking, and low scores on Anxiety, all of which are conceptually and empirically related to boldness. They also reported, however, that the successful psychopath was perceived as displaying high scores on several facets of Conscientiousness, including Competence and Order. In this regard, Gaughan, Miller, Pryor, and Lynam (2009) found that PPI FD was positively and significantly correlated with the Order facet of Conscientiousness, but not with other Conscientiousness facets-raising the possibility that personality attributes aside from boldness may differentiate successful from unsuccessful psychopathy (Lilienfeld et al., 2015a).

In support of the position that boldness is nonessential to psychopathy are data, reviewed earlier, indicating that boldness scores are in general only modestly associated with PCL-R Factor 1 scores and negligibly associated with Factor 2 scores, negligibly associated with LSRP total and factor scores, and weakly associated with measures of ASPD and other forms of externalizing psychopathology (Marcus et al., 2013; Miller & Lynam, 2012; Neumann, Johansson, & Hare, 2013). If one's nomological network for psychopathy accords a central role to antisocial behavior, these findings indeed raise questions regarding the relevance of boldness to the broader psychopathy construct. Needless to say, the finding that boldness is only weakly associated with other features of psychopathy (Marcus et al., 2013) calls into question its construct validity if-but only if-one presumes that psychopathy is syndromal.

At the measurement level, the discrepancy in associations between boldness and other psychopathy measures can be explained by sharp differences in the representation of boldness across these measures. As noted earlier, the trait of boldness is largely underrepresented in the PCL-R and measures developed from a PCL-R perspective, such as the LSRP (but see Neumann, Johannson, & Hare, 2013); in contrast, boldness receives considerably more prominent billing in the other psychopathy measures, including the PPI-R, TriPM, PRI, EPA, and SRP-III. These two "species" of measures provide differing conceptualizations and operationalizations of psychopathy, with the former being more psychologically maladaptive and the latter more psychologically adaptive.

#### Toward a Resolution of the Boldness Debate: Psychopathy as a Disorder of Interpersonal Impact

There is compelling evidence that a hefty chunk of the variance in continuous measures of most DSM personality disorders, as well as psychopathy, can be statistically predicted by scores on lower-order dimensions of personality, such as the facets of the NEO-PI-R (Miller et al., 2001; Samuel & Widiger, 2008; see Lilienfeld et al., 2015b). Yet the field of personality disorders has shown surprisingly little interest in the essential question of why only some configurations of personality traits, but not others, are associated with personality disorder pathology. Taking only the 30 facets of the NEO-PI-R, which hardly exhaust the full landscape of personality at the lower-order level, tens of thousands of configurations of low and high scores could in principle be associated with personality disorders. Why, then, is only a tiny subset of lower-order configurations—but not thousands of others—associated with consensual personality disorders?

The answer, we propose, is that certain personality trait configurations are especially interpersonally *impactful.* This hypothesis harkens back to the views of interpersonal theorists, who conceptualize personality disorders as interpersonally malignant configurations-not merely additive combinations-of personality traits (Grove & Tellegen, 1991; Lilienfeld & Fowler, 2006). From this perspective, classical psychopathy is a disorder of interpersonal impact: a conjunction of two, and perhaps three, traits that are associated with baleful social consequences. This view further implies that the psychopathy phenotype is an emergent property of two or more largely unrelated attributes. When all of these attributes are present, the interpersonal outcome is often pernicious because the composite clinical portrait that results is of an individual who superficially appears gregarious and prepossessing, yet is in fact interpersonally (and more rarely, physically) dangerous.

In this regard, Lykken (1991) discussed "impact traits" as dispositions conceptualized "in terms of the impact that the person has on his or her environment, especially the social environment" (p. 18). The field of personality disorders has largely overlooked the concept of impact traits, perhaps because it has typically embraced a narrowly psychometric approach to personality pathology that minimizes the interpersonal implications of personality traits. In this at times myopic program of research, indicators of traits that are not highly correlated with other indicators are routinely jettisoned from scales intended to assess a disorder. For example, upon discovering that the PPI-R Stress Immunity subscale is largely unrelated to other features of psychopathy, Visser, Ashton, and Pozzebon (2012) concluded that low trait anxiety is unlikely to be a core feature of psychopathy. Although Visser and colleagues acknowledged that their results are potentially consistent with dual process models that imply psychopathy is a configuration of boldness and disinhibition (Fowles & Dindo, 2006), they dismissed this possibility as unparsimonious. However, this conclusion may be premature given that low anxiety, especially of the social variety, might interact statistically with the more unpalatable features of psychopathy to yield an individual who presents with a poised and charming exterior that masks an affectively impoverished and interpersonally manipulative interior (e.g., Cleckley, 1941/1976). Similarly, as Patrick (2006) observed, items assessing low anxi-

#### ety were apparently excluded from the PCL early in its development because they were not highly associated with the other items on the measure.

The "folk concept" (Gough, 1966; see also Mc-Crae, Costa, & Piedmont, 1993) of the two-faced person, the wolf in sheep's clothing, the con artist, the smooth operator, the backstabber, the wheelerdealer, the used car salesman, the chameleon, and the like, captures the long-recognized social reality that some interpersonally treacherous individuals are not what they appear to be (see also Patrick, 2006). We suspect that this widely regarded folk concept is deeply embedded in popular culture in a plethora of forms for one reason in particular: It describes people who can readily dupe and deceive us. We have learned to attend to such individuals because at some level we know that we need to be on our guard around them.

This potent archetype is not a classical psychometric syndrome in nature, if by "nature" we mean only psychometric reality. Instead, from the perspective of our interpersonal model of personality disorders, it is a "folk syndrome," one that arises from the accurate perception that people who are conjointly (1) interpersonally poised and friendly but (2) interpersonally and affectively impoverished pose a particular hazard to us. In this sense, psychopathy is a disorder of personality (Lynam & Derefinko, 2006; Widiger & Lynam, 1998). Yet, it is just as much a disorder of interpersonal dysfunction, as it reflects a potentially malignant configuration of specific dispositional tendencies-one that bears marked implications for social behavior and its consequences (see also Edens, Clark, Smith, Cox, & Kelley, 2013).

The interpersonal impact hypothesis may help to explain why the notion that psychopathy is taxonic is so intuitively appealing and apparently so widely held (Berg et al., 2013). Anecdotally, several clinicians and researchers have told us (in paraphrased words), "Once you see a few real psychopaths, you'll know they are different in kind from other people." We suspect that these individuals are committing what William James (1890) termed the "psychologist's fallacy," which he famously explained as follows: "The great snare of the psychologist is the confusion of his own standpoint with that of the mental fact about which he is making his report" (p. 196). In this case, we posit that the fallacy consists of assuming that because the configuration of traits comprising psychopathy creates a distinctive impression on us as observers, this configuration must be taxonic in nature. Put somewhat differently, we conjecture

that psychopathy *is* distinctive after all, but not in the Aristotelian or Platonic sense of embodying a unique essence or etiology (Lilienfeld et al., 2015b). Instead, psychopathy may best be construed as a "folk taxon," a specific constellation of personality dimensions that "feels" taxonic because of its distinct subjective impact on us (the same conclusion may hold for at least some other personality disorders, such as BPD and NPD). More speculatively, the compound construct that we recognize as psychopathy may activate our (partly innate) cheater detection systems (Barkow, Comsides, & Tooby, 1992; but see Fodor, 2000), rendering us vigilant against exploitation.

Our proposed model of psychopathy as a disorder of interpersonal impact has yet to be subjected to stringent empirical tests, but it engenders certain falsifiable hypotheses. In particular, the model generates the prediction that boldness, which can be thought of as a reasonable proxy for Cleckley's "mask" of seemingly healthy functioning (Lilienfeld, Patrick, et al., 2012; Patrick, 2006; but see Miller & Lynam, 2012, for a dissenting view), should interact statistically with disinhibition and perhaps coldness/meanness in statistically predicting interpersonally relevant outcomes. These statistical interactions, we contend, should be especially pronounced for outcomes that involve the success and frequency of interpersonal deception, such as lying, cheating, stealing, taking advantage of others, sexual seduction, and mate poaching. This deduction follows from the assumption that individuals most prone to chronic deceitfulness are those who are (1) seemingly trustworthy but (2) not in fact trustworthy. These are the very individuals whose efforts at dishonesty and manipulation are presumably most likely to be positively reinforced. As noted earlier, however, provisional tests of this interactional hypothesis have been mixed. We look forward to further "risky tests" (see Meehl, 1978) of this interpersonal impact model in the coming years, which should help either to corroborate or falsify of our interpersonal impact model of psychopathy.

## Concluding Thoughts: Taking Stock and Looking Ahead

The psychopathy field has typically neglected to recognize that the controversy regarding the role of boldness and other potentially adaptive features in psychopathy reflects more of an *analytic* than an *empirical* (synthetic) disagreement, to adopt Kant's (1781) well-worn distinction; that is, the debate hinges largely or entirely on definitional, not data-based, issues. Specifically, the controversy stems from the fact that scholars are conceptualizing, then operationalizing, psychopathy in two overlapping but different ways-as a function of focusing on two distinct "species" of individuals who have been described by a parade of alternative names over the years: ASPD versus psychopathy, secondary psychopathy versus primary psychopathy, unsuccessful psychopathy versus successful psychopathy, clinical versus subclinical psychopathy, aggressive versus stable psychopathy, simple versus complex psychopathy, and the like (Lilienfeld et al., 2015b). The personality traits comprising boldness are relevant almost exclusively to the latter, ostensibly more adaptive condition within each pairing (Venables et al., 2014).

Furthermore, psychologists have for too long neglected the possibility of an interpersonal perspective on psychopathy, one that poses the crucial question of why individuals with this condition persist in behaving in maladaptive and often self-destructive ways. We have offered a provisional answer that lends itself to falsifiable predictions: Prototypical psychopaths are chimeras who garner short-term reinforcement for their behaviors, which reflect the expression of a socially toxic configuration of unrelated or even seemingly contradictory traits (e.g., apparent trustworthiness conjoined with dishonesty) that are tied to deception success (Lilienfeld, Patrick, et al., 2012).

Although we wholeheartedly embrace a rigorous psychometric-trait approach to psychopathy, we suspect that this approach will not suffice to crack the mystery of why psychopathic individuals behave as they do. Conceptualizing psychopathy as "personality" is a useful step in the right direction, but it may not go far enough. Correlational and factor analyses of personality traits, indispensable as they are for *describing* psychopathy, are unlikely to be sufficient for understanding it. A complete understanding of psychopathy will come not only from deconstructing this condition into its more specific subcomponents, including boldness, but also from reconstructing it as a configuration of personality dimensions in their fullfledged interpersonal manifestations (Lilienfeld et al., 2015b). To do so, we need to step away from the fit statistics nestled in our computer printouts and unpack the powerful implications of boldness and other psychopathy-related traits for everyday life. We also need to consider the implications of these traits not just for unsuccessful behaviors, but for successful ones as well. Examining the Michael Hararis of this world, along with the Ted Bundys, will be indispensable to progress in this direction.

#### REFERENCES

- Albert, R. S., Brigante, T. R., & Chase, M. (1959). The psychopathic personality: A content analysis of the concept. *Journal of General Psychology*, 60, 17–28.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: Author.
- Andershed, H., Kerr, M., Stattin, H., & Levander, S. (2002). Psychopathic traits in non-referred youths: Initial test of a new assessment tool. In E. Blaauw, J. M. Philippa, K. C. M. P. Ferenschild, & B. van Lodensteijn (Eds.), Psychopaths: Current international perspectives (pp. 131–158). The Hague: Elsevier.
- Anderson, J. L., Sellbom, M., Wygant, D. B., Salekin, R. T., & Krueger, R. F. (2014). Examining the associations between DSM-5 Section III antisocial personality disorder traits and psychopathy in community and university samples. *Journal of Personality Disorders*, 28(5), 675–697.
- Barkow, J. H., Cosmides, L. E., & Tooby, J. E. (1992). The adapted mind: Evolutionary psychology and the generation of culture. New York: Oxford University Press.
- Benning, S. D., Patrick, C. J., Blonigen, D. M., Hicks, B. M., & Iacono, W. G. (2005). Estimating facets of psychopathy from normal personality traits: A step toward community epidemiological investigations. Assessment, 12, 3–18.
- Benning, S. D., Patrick, C. J., Hicks, B. M., Blonigen, D. M., & Krueger, R. F. (2003). Factor structure of the Psychopathic Personality Inventory: Validity and implications for clinical assessment. *Psychological As*sessment, 15, 340–350.
- Benning, S. D., Patrick, C. J., & Iacono, W. G. (2005). Psychopathy, startle blink modulation, and electrodermal reactivity in twin men. *Psychophysiology*, 42, 753–762.
- Berg, J. M., Lilienfeld, S. O., & Sellbom, M. (2017). The role of boldness in psychopathy: A study of academic and clinical perceptions. *Personality Disorders: Theo*ry, *Research, and Treatment*, 8, 319–328.
- Berg, J. M., Smith, S. F., Watts, A. L., Ammirati, R., Green, S. E., & Lilienfeld, S. O. (2013). Misconceptions regarding psychopathic personality: Implications for clinical practice and research. *Neuropsychiatry*, 3(1), 63–74.
- Bergman, R. (2014, September 22). We were never killers, but we did what we had to do to defend Israel. Retrieved from www.ynetnews.com/ articles/0,7340,L-4573909,00.html.
- Berry, C. M., Sackett, P. R., & Wiemann, S. (2007). A review of recent developments in integrity test research. Personnel Psychology, 60(2), 271–301.

- Blonigen, D. M., Patrick, C. J., Douglas, K. S., Poythress, N. G., Skeem, J. L., Lilienfeld, S. O., et al. (2010). Multimethod assessment of psychopathy in relation to factors of internalizing and externalizing from the Personality Assessment Inventory: The impact of method variance and suppressor effects. *Psychological Assessment*, 22, 96–107.
- Cleckley, H. (1946). Psychopath: A problem for society. Federal Probation Journal, 10, 22–28.
- Cleckley, H. (1976). *The mask of sanity*. St. Louis, MO: Mosby. (Original work published 1941)
- Cohen, J. (1988). Statistical power for the behavioral sciences. Hillside, NJ: Erlbaum.
- Conger, A. J. (1974). A revised definition for suppressor variables: A guide to their identification and interpretation. Educational and Psychological Measurement, 34, 35–46.
- Costa, P. T., & McCrae, R. R. (1992). NEO PI-R: Professional manual. Odessa, FL: Psychological Assessment Resources.
- Costa, P. T., & McCrae, R. R. (2008). The revised NEO Personality Inventory (NEO-PI-R). In The SAGE handbook of personality theory and assessment: Vol. 2. Personality measurement and testing (pp. 179–198). Thousand Oaks, CA: SAGE.
- Crego, C., & Widiger, T. A. (2014). Psychopathy, DSM-5, and a caution. Personality Disorders: Theory, Research, and Treatment, 5, 335–347.
- Crego, C., & Widiger, T. (2015). Psychopathy and the DSM. Journal of Personality, 83, 665-677.
- Crego, C., & Widiger, T. A. (2016). Cleckley's psychopaths: Revisited. Journal of Abnormal Psychology, 125, 75–87.
- Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin*, 52, 281–302.
- Cuthbert, B. N., & Insel, T. R. (2013). Toward the future of psychiatric diagnosis: The seven pillars of RDoC. BMC Medicine, 11, 126.
- Davis, M. (2006). Neural systems involved in fear and anxiety measured with fear-potentiated startle. *American Psychologist*, 61, 741–756.
- Dindo, L., & Fowles, D. (2011). Dual temperamental risk factors for psychopathic personality: Evidence from self-report and skin conductance. *Journal of Per*sonality and Social Psychology, 100, 557–566.
- Drislane, L. E., Patrick, C. J., & Arsal, G. (2014). Clarifying the content coverage of differing psychopathy inventories through reference to the Triarchic Psychopathy Measure. *Psychological Assessment*, 26, 350–362.
- Dvorak-Bertsch, J. D., Curtin, J. J., Rubinstein, T. J., & Newman, J. P. (2009). Psychopathic traits moderate the interaction between cognitive and affective processing. *Psychophysiology*, 46, 913–921.
- Edens, J. F., Clark, J., Smith, S. T., Cox, J., & Kelley, S. E. (2013). Bold, smart, dangerous and evil: Perceived correlates of core psychopathic traits among

jury panel members. Personality and Mental Health, 7, 143–153.

- Eysenck, H. J., & Eysenck, S. B. G. (1975). Manual of the Eysenck Personality Questionnaire (junior and adult). London: Hodder & Stoughton.
- Few, L. R., Lynam, D. R., Maples, J. L., MacKillop, J., & Miller, J. D. (2015). Comparing the utility of DSM-5 Section II and III antisocial personality disorder diagnostic approaches for capturing psychopathic traits. Personality Disorders: Theory, Research, and Treatment, 6, 64–74.
- Few, L. R., Miller, J. D., & Lynam, D. R. (2013). An examination of the factor structure of the Elemental Psychopathy Assessment. Personality Disorders: Theory, Research, and Treatment, 4(3), 247–253.
- Fodor, J. (2000). Why we are so good at catching cheaters. Cognition, 75, 29–32.
- Fowles, D. C. (1980). The three arousal model: Implications of Gray's two-factor learning theory for heart rate, electrodermal activity, and psychopathy. *Psychophysiology*, 17, 87–104.
- Fowles, D. C., & Dindo, L. (2006). A dual-deficit model of psychopathy. In C. J. Patrick (Ed.), *Handbook of* psychopathy (pp. 14–34). New York: Guilford Press.
- Frost, B. C., Ko, C. H. E., & James, L. R. (2007). Implicit and explicit personality: A test of a channeling hypothesis for aggressive behavior. *Journal of Applied Psychology*, 92(5), 1299–1319.
- Fulton, J. J., Marcus, D. K., & Payne, K. T. (2010). Psychopathic personality traits and risky sexual behavior in college students. *Personality and Individual Differences*, 49(1), 29–33.
- Fulton, J. J., Marcus, D. K., & Zeigler-Hill, V. (2014). Psychopathic personality traits, risky sexual behavior, and psychological adjustment among college-age women. *Journal of Social and Clinical Psychology*, 33, 143–168.
- Gaughan, E. T., Miller, J. D., Pryor, L. R., & Lynam, D. R. (2009). Comparing two alternative measures of general personality in the assessment of psychopathy: A test of the NEO-PI-R and the MPQ. Journal of Personality, 77, 965–996.
- Goldberg, L. R., & Rosolack, T. K. (1994). The Big Five factor structure as an integrative framework: An empirical comparison with Eysenck's PEN model. In C. F. Halverson, Jr., G. A. Kohnstamm, & R. P. Martin (Eds.), The developing structure of temperament and personality from infancy to adulthood (pp. 7–35). New York: Psychology Press.
- Goodwin, D. K. (2013). The bully pulpit: Theodore Roosevelt, William Howard Taft, and the golden age of journalism. New York: Simon & Schuster.
- Gough, H. G. (1966). A cross-cultural analysis of the CPI Femininity scale. *Journal of Consulting Psychol*ogy, 30, 136–141.
- Grant, A. M., & Schwartz, B. (2011). Too much of a good thing: The challenge and opportunity of the inverted U. Perspectives on Psychological Science, 6, 61–76.

- Gray, J. A. (1982). The neuropsychology of anxiety: An enquiry into the function of the septo-hippocampal system. Oxford, UK: Oxford University Press.
- Gray, K. G., & Hutchison, H. C. (1964). The psychopathic personality: A survey of Canadian psychiatrists' opinions. *Canadian Psychiatric Association Journal*, 28, 452–461.
- Grove, W. M., & Tellegen, A. (1991). Problems in the classification of personality disorders. *Journal of Per*sonality Disorders, 5, 31–42.
- Hall, J. R., & Benning, S. D. (2006). The "successful" psychopath: Adaptive and subclinical manifestations of psychopathy in the general population. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 459–478). New York: Guilford Press.
- Hall, J. R., Drislane, L. E., Murano, M., Patrick, C. J., Lilienfeld, S. O., & Poythress, N. G. (2014). Development and validation of Triarchic construct scales from the Psychopathic Personality Inventory. *Psychological Assessment*, 26, 447–461.
- Hare, R. D. (1965). Temporal gradient of fear arousal in psychopaths. *Journal of Abnormal Psychology*, 70, 442–445.
- Hare, R. D. (1978). Electrodermal and cardiovascular correlates of psychopathy. In R. D. Hare & D. Schalling (Eds.), *Psychopathic behavior: Approaches to research* (pp. 107–144). New York: Wiley.
- Hare, R. D. (1982). Psychopathy and the personality dimensions of psychoticism, extraversion and neuroticism. Personality and Individual Differences, 3, 35–42.
- Hare, R. D. (1993). Without a conscience: The disturbing world of the psychopaths among us. New York: Pocket Books.
- Hare, R. D. (2003). Manual for the Revised Psychopathy Checklist (2nd ed.). Toronto: Multi-Health Systems. (Original work published 1991)
- Harkness, A. R., & Lilienfeld, S. O. (1997). Individual differences science for treatment planning: Personality traits. *Psychological Assessment*, 9, 349–360.
- Hecht, L. K., Berg, J. M., Lilienfeld, S. O., & Latzman, R. D. (2016). Parsing the heterogeneity of psychopathy and aggression: Differential associations across dimensions and gender. *Personality Disorders: Theory, Research, and Treatment*, 7(1), 2–14.
- Henderson, D. K. (1939). Psychopathic states. New York: Norton.
- Hicks, B. M., Johnson, W., Durbin, C. E., Blonigen, D. M., Iacono, W. G., & McGue, M. (2013). Gene–environment correlation in the development of adolescent substance abuse: Selection effects of child personality and mediation via contextual risk factors. *Development and Psychopathology*, 25, 119–132.
- Hicks, B. M., Markon, K. E., Patrick, C. J., Krueger, R. F., & Newman, J. P. (2004). Identifying psychopathy subtypes on the basis of personality structure. *Psychological Assessment*, 16, 276–288.
- Holden, R. R., & Passey, J. (2010). Socially desirable responding in personality assessment: Not necessarily

faking and not necessarily substance. *Personality and Individual Differences*, 49(5), 446–450.

- Hopwood, C. J., & Donnellan, M. B. (2010). How should the internal structure of personality inventories be evaluated? *Personality and Social Psychology Review*, 14, 332–346.
- Hough, L. M., & Schneider, R. J. (1996) Personality traits, taxonomies, and applications in organizations. In K. R. Murphy (Ed.), *Individual differences and behavior in organizations* (pp. 31–87). San Francisco: Jossey-Bass.
- Hoyle, R. H., Fejfar, M. C., & Miller, J. D. (2000). Personality and sexual risk taking: A quantitative review. *Journal of Personality*, 68, 1203–1231.
- Insel, T., Cuthbert, B., Garvey, M., Heinssen, R., Pine, D. S., Quinn, K., et al. (2010). Research domain criteria (RDoC): Toward a new classification framework for research on mental disorders. *American Journal of Psychiatry*, 167, 748–751.
- James, L. R. (2008). On the path to mediation. Organizational Research Methods, 11, 359–363.
- James, W. (1890). The principles of psychology (Vol. 1). New York: Holt.
- Jordan, P. (2007, November 16). Evel never dies. Maxim. Retrieved December 4, 2017, from www.maxim.com/ entertainment/evel-never-dies.
- Kant, I. (1781). A critique of pure reason. New York: Penguin.
- Karpman, B. (1941). On the need of separating psychopathy into two distinct clinical types: Symptomatic and idiopathic. *Journal of Criminology and Psychopathology*, 3, 112–137.
- Kastner, R. M., & Sellbom, M. (2012). Hypersexuality in college students: The role of psychopathy. Personality and Individual Differences, 53(5), 644–649.
- Kazdin, A. E. (1983). Psychiatric diagnosis, dimensions of dysfunction, and child behavior therapy. *Behavior Therapy*, 14, 73–99.
- Kochanska, G., Aksan, N., & Joy, M. E. (2007). Children's fearfulness as a moderator of parenting in early socialization: Two longitudinal studies. *Developmental Psychology*, 43, 222–237.
- Kramer, M. D., Patrick, C. J., Krueger, R. F., & Gasperi, M. (2012). Delineating physiologic defensive reactivity in the domain of self-report: Phenotypic and etiologic structure of dispositional fear. *Psychological Medicine*, 42, 1305–1320.
- Krueger, R. F., Derringer, J., Markon, K. E., Watson, D., & Skodol, A. E. (2012). Initial construction of a maladaptive personality trait model and inventory for DSM-5. Psychological Medicine, 42, 1879–1890.
- Latzman, R. D., Drislane, L. E., Hecht, L. K., Brislin, S. J., Patrick, C. J., Lilienfeld, S. O., et al. (2016). A chimpanzee (*Pan troglodytes*) model of triarchic psychopathy constructs development and initial validation. *Clinical Psychological Science*, 4(1), 50–66.
- LeDoux, J. E. (2015). Anxious: Using the brain to understand and treat fear and anxiety. New York: Penguin.

- Levenson, M. R., Kiehl, K. A., & Fitzpatrick, C. M. (1995). Assessing psychopathic attributes in a noninstitutionalized population. *Journal of Personality and Social Psychology*, 68, 151–158.
- Lilienfeld, S. O. (1990). Development and preliminary validation of a self-report measure of psychopathic traits in noncriminal populations. Doctoral dissertation, University of Minnesota, Minneapolis, MN.
- Lilienfeld, S. O. (2013). Is psychopathy a syndrome?: Commentary on Marcus, Fulton, and Edens. Personality Disorders: Theory, Treatment, and Research, 4, 85–86.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in noncriminal population. *Journal of Personality Assessment*, 66, 488–524.
- Lilienfeld, S. O., & Fowler, K. A. (2006). The self-report assessment of psychopathy: Problems, pitfalls, and promises. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 107–132). New York: Guilford Press.
- Lilienfeld, S. O., Latzman, R. D., Watts, A. L., Smith, S. F., & Dutton, K. (2014). Correlates of psychopathic personality traits in everyday life: Results from a large community survey. *Frontiers in Psychology*, 5, 740.
- Lilienfeld, S. O., Patrick, C. J., Benning, S. D., Berg, J., Sellbom, M., & Edens, J. F. (2012). The Role of fearless dominance in psychopathy: Controversies, confusions, and clarifications. *Personality Disorders: Theory, Practice, and Research*, 3, 327–340.
- Lilienfeld, S. O., Smith, S. F., Sauvigné, K. C., Patrick, C. J., Drislane, L. E., Latzman, R. D., et al. (2016). Is boldness relevant to psychopathic personality?: Meta-analytic relations with non-PCL-based measures of psychopathy. *Psychological Assessment, 28*, 1172–1185.
- Lilienfeld, S. O., Waldman, I. D., & Israel, A. C. (1994). A critical examination of the use of the term and concept of comorbidity in psychopathology research. *Clinical Psychology: Science and Practice*, 1, 71–83.
- Lilienfeld, S. O., Waldman, I. D., Landfield, K., Watts, A. L., Rubenzer, S., & Faschingbauer, T. R. (2012). Fearless dominance and the US presidency: Implications of psychopathic personality traits for successful and unsuccessful political leadership. *Journal of Per*sonality and Social Psychology, 103, 489–505.
- Lilienfeld, S. O., Watts, A. L., & Smith, S. F. (2015a). Successful psychopathy: A scientific status report. *Current Directions in Psychological Science*, 24, 298– 303.
- Lilienfeld, S. O., Watts, A. L., & Smith, S. F. (2016). Are the right stuff and the wrong stuff flip sides of the same coin? In V. Zeigler-Hill & D. K. Marcus (Eds.), *The dark side of personality: Science and practice in social, personality, and clinical psychology* (pp. 65–86). Washington, DC: American Psychological Association.
- Lilienfeld, S. O., Watts, A. L., Smith, S. F., Berg, J. M., & Latzman, R. D. (2015b). Psychopathy deconstructed and reconstructed: Identifying and assembling the

building blocks of Cleckley's chimera. Journal of Personality Disorders, 83, 593–610.

- Lilienfeld, S. O., & Widows, M. R. (2005). The Psychopathic Personality Inventory—Revised (PPI-R). Lutz, FL: Psychological Assessment Resources.
- López, R., Poy, R., Patrick, C. J., & Moltó, J. (2013). Deficient fear conditioning and self-reported psychopathy: The role of fearless dominance. *Psychophysiology*, 5, 210–218.
- Lorber, M. F. (2004). Psychophysiology of aggression, psychopathy, and conduct problems: A meta-analysis. Psychological Bulletin, 130, 531–552.
- Lykken, D. T. (1957). A study of anxiety in the sociopathic personality. *Journal of Abnormal and Social Psychology*, 55, 6–10.
- Lykken, D. T. (1982). Fearlessness: Its carefree charm and deadly risks. *Psychology Today*, 16, 20–28.
- Lykken, D. T. (1991). What's wrong with psychology anyway? In D. Cicchetti & W. M. Grove (Eds.), *Thinking clearly about psychology: Vol. 1. Matters of public interest* (pp. 3–39). Minneapolis, MN: University of Minnesota Press.
- Lykken, D. T. (1995). The antisocial personalities. Hillsdale, NJ: Erlbaum.
- Lynam, D. R., & Derefinko, K. J. (2006). Psychopathy and personality. In C. J. Patrick (Ed.), *Handbook of* psychopathy (pp. 133–155). New York: Guilford Press.
- Lynam, D. R., & Miller, J. D. (2013). Fearless dominance and psychopathy: A response to Lilienfeld et al. (2012). Personality Disorders: Theory, Treatment, and Research, 3, 341–353.
- Malterer, M. B., Lilienfeld, S. O., Neumann, C. S., & Newman, J. P. (2010). Concurrent validity of the Psychopathic Personality Inventory with offender and community samples. Assessment, 17, 3–15.
- Maples, J. L., Miller, J. D., Fortune, E., MacKillop, J., Campbell, W. K., Lynam, D. R., et al. (2013). An examination of the correlates of Fearless Dominance and Self-Centered Impulsivity among high-frequency gamblers. *Journal of Personality Disorders*, 28, 1–15.
- Marcus, D. K., Fulton, J. J., & Edens, J. F. (2013). The two-factor model of psychopathic personality: Evidence from the Psychopathic Personality Inventory. *Personality Disorders: Theory, Research, and Treatment*, 3, 140–154.
- Marcus, D. K., & Norris, A. L. (2014). A new measure of attitudes toward sexually predatory tactics and its relation to the triarchic model of psychopathy. *Journal* of Personality Disorders, 28, 247–261.
- McCrae, R. R., Costa, P. T., & Piedmont, R. L. (1993). Folk concepts, natural language, and psychological constructs: The California Psychological Inventory and the five-factor model. *Journal of Personality*, 61, 1–26.
- McKinley, J. C., & Hathaway, S. R. (1944). The Minnesota Multiphasic Personality Inventory: V. Hysteria, hypomania and psychopathic deviate. *Journal of Applied Psychology*, 28, 153–174.
- Meehl, P. E. (1978). Theoretical risks and tabular as-

terisks: Sir Karl, Sir Ronald, and the slow progress of soft psychology. *Journal of Consulting and Clinical Psychology*, 46, 806–834.

- Miller, J. D., & Lynam, D. R. (2012). An examination of the Psychopathic Personality Inventory's nomological network: A meta-analytic review. Personality Disorders: Theory, Research, and Practice, 3, 305–326.
- Miller, J. D., & Lynam, D. R. (2015). Understanding psychopathy using the basic elements of personality. Social and Personality Psychology Compass, 9, 223–237.
- Miller, J. D., Lynam, D. R., Widiger, T. A., & Leukefeld, C. (2001). Personality disorders as extreme variants of common personality dimensions: Can the Five Factor Model adequately represent psychopathy? *Journal of Personality*, 69, 253–276.
- Mullins-Sweatt, S. N., Glover, N. G., Derefinko, K. J., Miller, J. D., & Widiger, T. A. (2010). The search for the successful psychopath. *Journal of Research in Per*sonality, 44, 554–558.
- Murphy, B., Lilienfeld, S. O., Skeem, J., & Edens, J. F. (2016). Are fearless dominance traits superfluous in operationalizing psychopathy?: Incremental validity and sex differences. *Psychological Assessment*, 28, 1597–1607.
- Neumann, C. S., Johansson, P. T., & Hare, R. D. (2013). The Psychopathy Checklist—Revised (PCL-R), low anxiety, and fearlessness: A structural equation modeling analysis. Personality Disorders: Theory, Research, and Treatment, 4, 129–137.
- Neumann, C. S., Malterer, M. B., & Newman, J. P. (2008). Factor structure of the Psychopathic Personality Inventory (PPI): Findings from a large incarcerated sample. *Psychological Assessment*, 20, 169–174.
- Neumann, C. S., Uzieblo, K., Crombez, G., & Hare, R. D. (2013). Understanding the Psychopathic Personality Inventory (PPI) in terms of the unidimensionality, orthogonality, and construct validity of PPI-I and -II. Personality Disorders: Theory, Research, and Treatment, 4, 77–79.
- Patrick, C. J. (2006). Back to the future: Cleckley as a guide to the next generation of psychopathy research. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 605–617). New York: Guilford Press.
- Patrick, C. J. (2010). Operationalizing the triarchic conceptualization of psychopathy: Description of brief scales for assessment of boldness, meanness, and disinhibition. Unpublished manual, University of Minnesota, Minneapolis, MN.
- Patrick, C. J., & Bernat, E. (2009). Neurobiology of psychopathy: A two-process theory. In G. G. Berntson & J. T. Cacioppo (Eds.), *Handbook of neuroscience* for the behavioral sciences (pp. 1110–1131). New York: Wiley.
- Patrick, C. J., & Drislane, L. (2015). Triarchic model of psychopathy: Origins, operationalizations, and observed linkages with personality and general psychopathology. *Journal of Personality*, 83, 627–643.
- Patrick, C. J., Edens, J. F., Poythress, N. G., Lilienfeld, S. O., & Benning, S. D. (2006). Construct validity

of the Psychopathic Personality Inventory two-factor model with offenders. *Psychological Assessment*, 18, 204–208.

- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, 21, 913–938.
- Patrick, C. J., Venables, N. C., & Drislane, L. E. (2013). The role of fearless dominance in differentiating psychopathy from antisocial personality disorder: Comment on Marcus, Fulton, and Edens. *Personality Disorders: Theory, Research, and Treatment, 4*, 80–82.
- Paulhus, D., Neumann, C. S., & Hare, R. D. (2014). The SRP-III. Toronto: Multi-Health Systems.
- Paulhus, D. L., & Williams, K. M. (2002). The dark triad of personality: Narcissism, Machiavellianism, and psychopathy. *Journal of Research in Personality*, 36, 556–563.
- Poy, R., Segarra, P., Esteller, À., López, R., & Moltó, J. (2014). FFM description of the triarchic conceptualization of psychopathy in men and women. *Psychological Assessment*, 26(1), 69–76.
- Quay, H. C. (1965). Psychopathic personality as pathological stimulation-seeking. American Journal of Psychiatry, 122, 180–183.
- Rosenthal, R. (1979). The file drawer problem and tolerance for null results. *Psychological Bulletin*, 86, 638–641.
- Ross, S. R., Benning, S. D., Patrick, C. J., Thompson, A., & Thurston, A. (2009). Factors of the Psychopathic Personality Inventory: Criterion-related validity and relationship to the BIS/BAS and five-factor models of personality. Assessment, 16, 71–87.
- Samuel, D. B., & Widiger, T. A. (2008). A meta-analytic review of the relationships between the fivefactor model and DSM-IV-TR personality disorders: A facet level analysis. *Clinical Psychology Review*, 28, 1326–1342.
- Sellbom, M., Ben-Porath, Y. S., Patrick, C. J., Wygant, D. B., Gartland, D. M., & Stafford, K. P. (2012). Development and construct validation of MMPI-2-RF indices of global psychopathy, fearless-dominance, and impulsive-antisociality. *Personality Disorders: Theory, Research, and Treatment, 3*, 17–38.
- Sellbom, M., & Phillips, T. R. (2013). An examination of the triarchic conceptualization of psychopathy in incarcerated and nonincarcerated samples. *Journal of Abnormal Psychology*, 122, 208–214.
- Simpson, J. A., & Gangestad, S. W. (1991). Individual differences in sociosexuality: Evidence for convergent and discriminant validity. *Journal of Personality* and Social Psychology, 60, 870–883.
- Smith, G. T., Fischer, S., & Fister, S. M. (2003). Incremental validity principles of test construction. Psychological Assessment, 15, 467–477.
- Smith, S. F., & Lilienfeld, S. O. (2012). Psychopathy in the workplace: The knowns and unknowns. Aggression and Violent Behavior, 18, 204–218.

- Smith, S. F., Lilienfeld, S. O., Coffey, K., & Dabbs, J. M. (2013). Are psychopaths and heroes twigs off the same branch?: Evidence from college, community, and presidential samples. *Journal of Research in Per*sonality, 47(5), 634–646.
- Smith, S. F., Watts, A. L., & Lilienfeld, S. O. (2017). Miracle, menace, or both?: Implications of dark triad traits for the workplace. Manuscript in preparation.
- Smith, S. T., Edens, J. F., & McDermott, B. E. (2013). Fearless dominance and self-centered impulsivity interact to predict predatory aggression among forensic psychiatric inpatients. *International Journal of Foren*sic Mental Health, 12, 33–41.
- Smith, S. T., Edens, J. F., & Vaughn, M. G. (2011). Assessing the external correlates of alternative factor models of the Psychopathic Personality Inventory– Short Form across three samples. *Journal of Personality Assessment*, 93, 244–256.
- Stanley, J. H., Wygant, D. B., & Sellbom, M. (2012). Elaborating on the construct validity of the Triarchic Psychopathy Measure in a criminal offender sample. *Journal of Personality Assessment*, 95, 343–350.
- Sylvers, P., Lilienfeld, S. O., & LaPrairie, J. L. (2011). Differences between trait fear and trait anxiety: Implications for psychopathology. *Clinical Psychology Review*, 31, 122–137.
- Tellegen, A., & Waller, N. G. (2008). Exploring personality through test construction: Development of the Multidimensional Personality Questionnaire. In G. J. Boyle, G. Matthews, & D. H. Saklofske (Eds.), The Sage handbook of personality theory and assessment: Vol. 2. Personality measurement and testing (pp. 261– 292). Thousand Oaks, CA: SAGE.
- Turchik, J. A., & Garske, J. P. (2009). Measurement of sexual risk taking among college students. Archives of Sexual Behavior, 38, 936–948.
- Vaidyanathan, U., Hall, J. R., Patrick, C. J., & Bernat, E. M. (2011). Clarifying the role of defensive reactivity deficits in psychopathy and antisocial personality using startle reflex methodology. *Journal of Abnormal Psychology*, 120, 253–258.

Venables, N. C., Hall, J. R., & Patrick, C. J. (2014). Dif-

ferentiating psychopathy from antisocial personality disorder: A triarchic model perspective. *Psychological Medicine*, 44, 1005–1013.

- Visser, B. A., Ashton, M. C., & Pozzebon, J. A. (2012). Is low anxiety part of the psychopathy construct? *Journal of Personality*, 80, 725–747.
- Wall, T. D., Wygant, D. B., & Sellbom, M. (2015). Boldness explains a key difference between psychopathy and antisocial personality disorder. *Psychiatry*, *Psychology and Law*, 22(1), 94–105.
- Watts, A. L., Lilienfeld, S. O., DeMartino, P. A., & Sauvigné, K. C. (2015, June). A meta-analytic investigation of the fearlessness hypothesis of psychopathy. Poster presented at the 6th biennial meeting of the Society for the Scientific Study of Psychopathy, Chicago, IL.
- Watts, A. L., Lilienfeld, S. O., Edens, J. F., Douglas, K. S., Skeem, J. L., Verschuere, B., et al. (2016). Does response distortion statistically affect the relations between self-report psychopathy measures and external criteria? *Psychological Assessment*, 28, 294–306.
- Weber, M. (2014, September 27). Michael Harari, Israeli agent likened to James Bond, dies at 87. New York Times. Retrieved from www.nytimes.com/2014/09/28/ world/middleeast/michael-harari-israeli-agent-likenedto-james-bond-dies-at-87.html.
- Widiger, T. A., & Lynam, D. R. (1998). Psychopathy as a variant of common personality traits: Implications for diagnosis, etiology, and pathology. In T. Millon, E. Simonson, M. Birket-Smith, & R. D. Davis (Eds.), *Psychopathy: Antisocial, criminal, and violent behavior* (pp. 171–187). New York: Guilford Press.
- Widom, C. S. (1977). A methodology for studying noninstitutionalized psychopaths. Journal of Consulting and Clinical Psychology, 45, 674–683.
- Wilson, L., Miller, J. D., Zeichner, A., Lynam, D. R., & Widiger, T. A. (2011). An examination of the validity of the Elemental Psychopathy Assessment: Relations with other psychopathy measures, aggression, and externalizing behaviors. Journal of Psychopathology and Behavioral Assessment, 33, 315–322.
- Wolfe, T. (1979). The right stuff. New York: Random House.

# PART III

# ASSESSMENT AND DIAGNOSIS OF PSYCHOPATHY

# CHAPTER 9

# **Capturing Psychopathic Personality**

Penetrating the Mask of Sanity through Clinical Interview

# DAVID J. COOKE CAROLINE LOGAN

he nature and essence of psychopathic personality has long generated debate and controversy (e.g., Poythress & Petrila, 2010; Skeem & Cooke, 2010). Cleckley (1941) famously described psychopathy as involving a "mask of sanity"-a severe form of pathology concealed by an outward appearance of normality (see Patrick, Chapter 1, this volume). In this chapter, we consider how practitioners can effectively penetrate this mask-how they can engage productively with a client to develop a sophisticated, nuanced, and clinically relevant formulation that characterizes the unique manner in which symptoms are configured in the client, and how they may be relevant to future well-being and risk. We argue that proactive and proportionate intervention has the greatest chance of being effective when it follows from such a nuanced clinical formulation.

There are two major sections in this chapter. First, we provide a detailed analysis of the essential craft of effective clinical interviewing as applied to the assessment of psychopathy (i.e., interviewing techniques and practices that allow the skilled assessor to delve beyond the mask, explore the lived experience of psychopathy, and develop an evidence-based account of the particular symptom configuration and underlying mechanism of any specific client). Second, for such psychological tools to be effective, it is necessary to have a map of the terrain that may be encountered behind the mask. To this end, we describe a new conceptual model of the psychopathy construct: the Comprehensive Assessment of Psychopathic Personality (CAPP; Cooke, Hart, Logan, & Michie, 2004, 2012). We discuss the evolution of, and evidence in support of, the CAPP as a conceptual map of psychopathy and as a framework for its assessment by interview. We conclude with some comments and recommendations for the future of effective clinical assessment in the field of psychopathy.

## Interview Craft in Psychopathy Assessment

Clinical interviewing is an art as well as a technical endeavor (Shea, 1998). It is a high-level skill essential for creating opportunities for clients to reveal themselves to a practitioner who understands the value of the information so revealed, and for controlling and managing the dynamic between interviewer and interviewee. The craft of clinical interviewing is a core skill for all practitioners (Craig, 2005; Morrison, 2014; Rogers, 2001; Shea, 1998, 2007; Sommers-Flannagan & Sommers-Flannagan, 2014). However, it is a particularly essential skill for clinicians who work with clients with pronounced psychopathic traits. Clients with this presentation, especially if they are involved in legal proceedings, may deploy a variety of cleverand often subtle tactics-in interview settings in order to distort information about themselves and their beliefs and intentions (Kosson, Gacono, & Bodholdt, 2000; Meloy, 2005). Practitioners who overlook the need for good interview technique, or who fail to prepare for or anticipate such tactics, are at risk of having their control over the encounter challenged and their information-gathering objectives thwarted (Logan, 2013; Shepherd & Griffiths, 2013). However, practitioners who prepare, both in terms of their attention to interview skills and technique-"interview craft"-and their anticipation of the client's particular efforts at self-defense or preservation, are more likely to maintain control and fulfill their objectives.

Structured assessment protocols have a significant role to play in preparing for and organizing encounters with psychopathic clients who are likely to try to manage the clinical, psycholegal, or research evaluations they are required or volunteer to undergo. Self-report questionnaires are a frequently used assessment format with such clients. Unfortunately, such approaches are susceptible to intentional distortion and the impact of limited self-awareness (Blackburn, Donnelly, Logan, & Renwick, 2004; see also Sellbom, Lilienfeld, Fowler, & McCrary, Chapter 10, this volume). Semistructured clinical interviews-such as the CAPP described in detail below-provide a more extensive framework around which practitioners can organize their inquiries, detect and manage evasive tactics in response to particular lines of questioning, and plan their strategic approach to the interview encounter as a whole.

Nonetheless, structured assessment protocols are not a replacement for competent interview craft; an inept interviewer who administers an established, validated assessment instrument will not achieve a satisfactory clinical assessment by virtue of the use of such a tool because good interview craft is also required. Thus, a semistructured clinical interview in the hands of a prepared and skilled evaluator has the greatest potential to produce an effective interview. This is the case with clinical clientele in general-it is most especially the case with psychopathic clients. In our view, insufficient attention has been paid to the craft of interviewing with this challenging population. With this in mind, we focus in this chapter first on key issues related to the topic of interview craft, before describing the CAPP as a protocol for interviewbased assessment of psychopathic individuals.

In the first major section that follows, the basic principles of good interview craft are described, followed by a discussion of techniques relevant to clients with psychopathic traits. Consideration is given to both interview structure *and* process because it is the combination of the two that is required for optimally informative interview assessments with complex and challenging clients. Topics of interview preparation, strategy, and control are given particular emphasis.

#### **Core Clinical Interviewing Skills**

#### Preparations and Objectives

First encounters with clients of whatever kind, and for whatever purpose, should be prepared for in advance (Cooke, 2016; Logan, 2013). Prior to the first encounter, and based on referral information and all available file data, consideration should be given to a number of important matters, including (1) what to expect of the client in terms of his or her likely presentation, interest, motivation for attending, and possible expectations, as well as practical issues in the establishment of a productive working relationship; (2) the broad objectives of the first and subsequent interviews (to be finalized with the client on commencement of the interview); (3) the location for interview sessions to take place, and the physical arrangement of the room itself; (4) issues relating to capacity, consent, and confidentiality, and how and in what sequence these issues will be introduced and addressed as well as documented; (5) how the client might challenge the objectives of the interview and why; and (6) what approaches can be used to maintain the client's interest and engagement in these objectives over a sequence of meetings. That is, practitioners should commence their engagement with a client having already formed one or more preliminary hypotheses about key issues for the working relationship to come.

#### Introductions and Orientation

The first meeting between practitioner and client serves as an opportunity to exchange information about the matters listed earlier, agree on objectives, and test preliminary hypotheses about presentation, problems, and engagement. Practitioners must explain who they are and the nature of the service they represent, what they understand so far about the client and his or her difficulties, the nature of what they might try to do together to address these problems, and who will be informed about this work and how. There is an expectation that clients will in turn provide information about their problems and the challenges they face. They may seek information and clarifications from the practitioner, and be open at least to some degree to questions seeking detail and explanation. Ideally, on the basis of such a discussion, the goals for future sessions will be agreed upon collaboratively.

The client's mental capacity to engage in such proceedings will be assessed either informally or formally, depending on the practitioner's expectations and the reason for the encounter. And at some point, most likely near the beginning of the interview session, a statement will be made about the issues of consent to engage in the work planned and the confidentiality of all matters discussed. In many settings, certainly most forensic and all research settings, issues relating to capacity, consent, and confidentiality are committed to paper and a witnessed signature is required before commencement to indicate that the matter has been discussed and the extent of the agreement reached. This important stage in the proceedings should be regarded as an investment in the client's cooperation from this point on and should not be rushed (Logan, 2013).

Additional important tasks at the beginning of an engagement with a new client should include addressing his or her anxieties about the practitioner or the work they are to do together, developing rapport, establishing the centrality of the client's role in the work to follow, introducing strategies that will help the client to maximize recall of important events (e.g., drawing a time line), and encouraging the client to communicate as clearly as possible about feelings and beliefs pertaining to self and others. Shepherd and Griffiths (2013) summarize the key tasks in relationship building through interview as the promotion of Respect, Empathy, Supportiveness, Positiveness, Openness, Nonjudgemental attitude, Straightforward talk, and Equals talking "across" to one another (summarized by the acronym RESPONSE). Addressing such tasks in the initial interview session will help to encourage the appropriate psychological mood in the client and create the most helpful social dynamics between client and practitioner (Fisher & Gieselman, 1992). Conversation-fostering behaviors useful at this stage of the relationship include the demonstration of sincerity (e.g., through smiling or appropriate facial expressions such as interested concern), the use of an open posture, a forward lean and touch (e.g., a handshake at the commencement and conclusion of each meeting), good-quality eye contact when appropriate (i.e., a steadily held gaze rather than a penetrating stare), and nods of the head and supportive sounds to indicate active listening and attention (Shepherd & Griffiths, 2013; Sommers-Flanagan & Sommers-Flanagan, 2014).

#### Building the Relationship

Carl Rogers (1942) identified the "core conditions" of a positive working relationship between practitioners and their clients-necessary for the formation of an effective alliance and positive psychological outcomes of any kind-as congruence (i.e., the practitioner's thoughts, feelings, and behaviour are consistent with one another), unconditional positive regard (i.e., the client is accepted with value in his or her own right), and accurate empathic understanding (i.e., the practitioner strives to see the client's private world through the client's eyes). Such conditions, when present in the practitioner and evident to the client, build upon preparatory work done in the introductory phase. The practitioner establishes and maintains these conditions by the coherent interplay of verbal and nonverbal communications, which should convey genuinely felt interest in the client's condition and concerns, thus enhancing the client's motivation to attend and engage, and his or her positive or at least realistic expectations about the outcome of the encounter.

Poor planning and clumsy interview technique can thwart working relationships between practitioners and clients. Shepherd and Griffiths (2013) describe poor interviews as those demonstrating some of the following features: The practitioner talks too much, thus denving the client time to think and contribute; the practitioner does not pay sufficient attention to what the client says; he or she pursues self-defined objectives rather than goals agreed upon with the client; the practitioner limits the client's latitude to contribute freely to the discussion by dominating the conversation and interrupting the client; the practitioner makes preemptive assertions, assuming or directly claiming knowledge of the client's forthcoming answers; the practitioner asks constraining questions and fill gaps in the conversation; and he or she changes topics unpredictably and rushes through questions, interrupting the client, both affecting the client's concentration and excusing the client from having to recall important information. More appropriately, practitioners should pace their conversations, ask single rather than multiple or layered questions, use silence considerately, use open questions (e.g., "What are your plans?") and gentle commands (e.g., "Tell me about school") when information is required and closed questions only for points of clarification or to aid focus, avoid potentially confusing questions that are negatively worded—and in the process maintain a steadily held and inquiring gaze on the client that encourages detail and disclosure (Shea, 1998; Sommers-Flanagan & Sommers-Flanagan, 2014).

#### Listening

Listening is a skill best exercised quietly (Morrison, 2014; Shea, 1998; Yeschke, 2002). Good listening makes a client feel heard and worthy of interest-and importantly, inclined to say more. What does good listening look like? First, good listening is more likely to be evident in encounters with clients in which the practitioner talks less than 50% of the time (Shepherd & Griffiths, 2013). Second, good listening involves a steadily held gaze that is not overly broken by the practitioner looking away to write notes-certainly not at points in the conversation when important matters are being discussed or feelings expressed, which is exactly when the temptation to record is likely to be strongest (Shea, 1998). Third, practitioners who see the value in listening to their clients communicate this nonverbally, for example, by a slight forward lean, by attending behaviors such as head nods, by an attentive facial expression, and through obvious concentration on and interest in what the client is saving (Sommers-Flanagan & Sommers-Flanagan, 2014). Fourth, practitioners also communicate their willingness to listen through the judicious use of statements that are a mixture of reflections on what has been said, clarification queries, validating comments, interpretations, and summaries (Sommers-Flanagan & Sommers-Flanagan, 2014). And fifth, good listening involves not filling gaps to help the client out at times of apparent discomfort, which can reflect the practitioner's feelings more so than those of the client. Filling gaps—limiting silence—may encourage the client to say less rather than more.

Good listening enables the practitioner to nurture the flow of both verbal and nonverbal information—information both provided and revealed (Sommers-Flanagan & Sommers-Flanagan, 2014). Effective listening creates opportunities for practitioners to observe and, in the course of observing, to understand the client's own private world through scrutiny of his or her choice of words and how the client expresses them verbally and physically, by the degree of congruence between the content and manner/tone of the client's speech, by what the client reveals about his or her understanding of self and others through perspectives taken or not taken, and finally, through the attitudes and opinions the client expresses. Hurrying through interviews, and posing questions without focused observation or listening, denies practitioners the opportunity to benefit from what they see and perceive, in addition to what they hear (Shea, 1998).

### The Formal Evaluation Process

Some practitioners meet with clients simply to assess them. Other practitioners meet with clients in order to understand their problems, with a view toward working together in therapy to resolve them. In either scenario, formal psychological assessments may be included-such as a mental status examination, a self-report questionnaire, semistructured or structured interviews, other more objective assessments (e.g., neurocognitive tests), and observations. The use of formal evaluations should be discussed early in the engagement between the practitioner and the client, and again just prior to their administration. And the use of such assessments should not dominate proceedings or overshadow the importance of developing and maintaining a good working relationship (Logan, 2013). Practitioners should administer formal assessments themselves rather than having students or assistants conduct them-because such procedures afford opportunities to observe the client working in an alternative way with the practitioner. Specifically, formal assessments provide contexts for gathering information from clients regarding their attitudes toward structured testing, their fear of failure or poor performance, their beliefs in relation to the specific questions asked, and so on (Logan, 2013). Furthermore, bringing another person into the assessment session, such as a student, can be confusing and disruptive to the relationship being formed with the practitioner.

#### Drawing Interviews to a Close

Closing sessions with clients—at the point of completing either short-term assessments or longer

therapeutic interventions-provides an opportunity both to review achievements made relative to objectives and to identify any matters outstanding, and to plan continuing pathways for support or treatment. Important aims at this stage include (1) helping clients determine whether they gained something helpful from the encounter, even if it was simply the orderly exploration of problems with a concerned listener (Sullivan, 1970), (2) having clients feel comfortable, both with the practitioner and with the nature of the work they have engaged in together, (3) helping to ensure continuing trust between practitioner and client following completion of their current working relationship, and (4) permitting the practitioner to experience a constructive sense of satisfaction with the nature of the work undertaken and the outcomes achieved (Shea, 1998). The extent to which these aims for closing the meeting are satisfied will depend largely on the course and effectiveness of work the practitioner and client have undertaken together. However, it is at the point of completion of the client-therapist exchange that such feelings can be acknowledged and enhanced. And such enhancements matter in particular when possibilities exist for further encounters with a client in future. They matter also because it is at this stage that clients may feel safe enough to mention key pieces of information that they have previously been reluctant to mention. To allow for such disclosures, it is recommended that practitioners leave time at the end of the concluding session for final open communication. A final reminder of what was agreed upon regarding confidentiality and documentation of observations and findings to others constitutes a further recommended component of the final meeting.

#### Effective Interview Craft with Clients Exhibiting Psychopathic Traits

Good interview craft with clients exhibiting high levels of psychopathic traits should be grounded in all of the key practices listed earlier. However, some of these practices may require elaboration or modification to be effective with such clients, and other techniques beyond these are also likely to be needed. Specifically, attention is required in the areas of preparation and objectives relating to consent and confidentiality, interview strategy, control and interview dynamics, detecting deception, coping with challenge, and interview styles for male versus female psychopathic clients.

#### Preparation and Objectives

Interviewing clients with known or suspected psychopathic traits, including administration of the CAPP as described below, requires preparation as a matter of necessity. While conspicuous planning for interviews might challenge the psychopathic client to assert his or her dominance in response, the absence of any planning or preparation is an invitation to the client to take control and regard the practitioner as weak and foolish. Preparations should include a range of background reading, with particular focus on past observations and formal assessments of personality. An interview plan should consider what is understood about the client's personality style, as well as a clear set of objectives for each interview and the overall series of interviews to come. With regard to objectives, these should include at a minimum the following: (1) gathering relevant information during the course of an open dialogue between the practitioner and the client, in which the client's continued engagement is prioritized; (2) detecting and monitoring patterns of defensive and deceptive responding; (3) managing resistance and minimizing its impact on information gathering; (4) challenging inconsistences, both between the client's self-report and the reports and observations of others, and within the client's self-report over one or more interviews; and (5) staying in control of each encounter (Logan, 2013). With regard to issues relating to consent and confidentiality, while clarifications about the extent of both are important in all practitioner-client interactions, they are particularly essential with clients who are likely to challenge all aspects of the encounter, including its outcome (Lyon & Ogloff, 2000). With such clients, unambiguous documentary evidence of the consent obtained and of agreement to the limits of confidentiality should be regarded as a necessity and retained in a safe place in the event that they are required in legal proceedings.

#### Interview Strategy: A Personality-Based Approach

An "interview strategy" is a formal plan for the organization and form of the meeting or meetings to come between the practitioner and the client (Logan, 2013). It should address a number of key points. First, the strategy should list the objectives of each expected interview and of the encounter as a whole. Second, the strategy should

outline how the practitioner anticipates the client will approach the interviews and his or her engagement with the practitioner. For example, a practitioner might expect a psychopathic client to appear cooperative but be resistant or evasive in response to specific enquiries about his or her harmful conduct. The practitioner's expectations about the client's response to interviews should be influenced by what is understood-or hypothesized—at this stage about the client's personality style. For example, if the client has pronounced paranoid traits, additional information may be required and attention paid to managing the anxieties of the client at the beginning of each interview, more so than might be expected in a client who is less suspicious. Another example would be to expect to make interviews short but frequent with clients with pronounced antisocial or borderline features in order to manage poor concentration and disinhibition. Pronounced narcissistic traits, in which features of antagonism dominate, should encourage a practitioner to anticipate a client's efforts to control meetings through long rambling stories and the need, therefore, to interrupt him or her to move on to other topics due to constraints on time. Such interruptions can potentially be managed by alerting clients of the possible need to do so at the beginning, thereby offsetting the risk of narcissistic rage and disengagement. This personality-based approach is recommended in all investigative and forensic interviews (Ackley, Mack, Beyer, & Erdberg, 2011) and especially in interviews with psychopathic clients.

Third, the interview strategy should take account of what is understood about the client's experience of evaluations in the past, and what he or she thinks is to be gained or indeed lost by engaging now. Such information is gleaned from past reports that address the quality of interviews then, or more ideally, directly from those who undertook past evaluations. Anticipating what the client will bring into interviews enables a higher level of preparation and, therefore, engagementnurturing responses.

Fourth, the interview strategy should list the tactics the client may deploy, deliberately or otherwise, to limit the practitioner's ability to achieve objectives. For example, from what is understood about a particular client and how he or she has responded to assessments previously, the practitioner may expect the client to use widely varying and rapidly changing emotions as a way of distracting the practitioner, in addition to obfuscation in order to enhance practitioner confusion and uncertain-

ty. And alongside the practitioner's list of expected defensive techniques should be options for their respective management—for example, use of multiple interviews to allow for more gradual and focused consideration of individual issues, recording of interviews or use of co-interviewers to allow for postsession reviews of information provided, and endeavouring to understand the function of defensive tactics both directly with the client and in subsequent clinical review or supervision sessions. By preparing for the use of such defensive tactics by the client, the practitioner is more likely to be able to manage their influence on interview objectives.

Fifth, the interview strategy should also include a list of topics to be covered-or tasks to be addressed—in the interviews to come, each with a set of introductory questions and follow-up probes. Topics and tasks should be arranged in order of the extent to which they might be demanding of the client; that is, the least threatening topics (e.g., education or employment history) should be addressed first, working through to the most threatening topics (e.g., offending behavior) toward the end (Logan, 2013). Such an order of progress enables the practitioner to observe a "baseline" level of interview responding-responding to noncontentious questions with a degree of comfort-in order to make more obvious whether and when the client's level of comfort changes, and how, in response to topics that are evidently more challenging ("hotspots"; Frank, Yarborough, & Ekman, 2006). As discussed below, the CAPP has been specifically designed to follow just such a course, creating the opportunity to build an interview in terms of its focus and intensity.

Sixth, a strategic approach to interviews should incorporate a process of "successive approximation" toward the objectives of the engagement (McGrath, 1990). This means that contentious subjects ("hotspots") are approached repeatedly, from different angles, interspersed with more neutral topics—enabling sustained enquiry about a subject the client may otherwise find difficult to discuss, and offering opportunities for the practitioner to detect inconsistencies in the client's account when they arise. In addition, such a process can highlight the efforts a client may make to try to control interviews and distract the practitioner from challenging subjects (Logan, 2013).

#### Control and Interview Dynamics

Clients with psychopathic traits seek to take control of encounters from which they perceive opportunities for gain. For example, if a client believes that a practitioner's negative opinion will count against him or her, the client may try to control the encounter to influence that opinion in a positive direction—for example, by flattering the practitioner (e.g., calling attention to the practitioner's status or expertise) or encouraging the practitioner to view him or her as special or different and therefore better than clients previously evaluated. As another example, a psychopathic client (e.g., a young intelligent male) may view the practitioner (e.g., a young intelligent male) as competition to be challenged in a sporting battle of wills or as a conquest to be made, regardless of the actual purpose of their meeting. These are not uncommon aspirations or preoccupations in many clients. However, two features in particular that set psychopathic clients apart from others are the lengths to which they will go to achieve their objectives (e.g., positive impression, conquest), and the extremity of their response when their attempts to do are thwarted (e.g., disengagement, or even sabotage, regardless of the consequences to themselves; denigration of the practitioner).

What can practitioners do to recognize the forces that may come to play in their interviews with psychopathic clients and effectively manage them? First, they can anticipate that behaviors of these types may be present in initial encounters with psychopathic clients and play a role in the meetings that follow. The previously noted personalitybased approach to interviewing directly addresses this requirement by encouraging the practitioner to anticipate what the client may seek to control, and also why and how. In addition, practitioners should review their past professional experiences to identify approaches that worked in their more successful interviews with psychopathic clients, and determine what they failed to anticipate in their least successful interviews with such individuals that resulted in objectives not being met. Past failures can provide clues to areas of weakness—such as the practitioner's own susceptibility to flattery, or his or her engagement in competitive banter with the client—that can be amended or guarded against in future interview sessions. Practitioners should know themselves well, and be aware of their strengths and weaknesses as interviewers, in order to understand what they may bring to encounters with clients who are motivated to manage the outcome.

Second, there are approaches practitioners can use to lessen a client's desire to try to take control of proceedings, thus helping to keep the interview to its objectives. For example, practitioners can avoid triggering a client's need to take control by making it seem as though the client is already in control. Queries of the following type can be useful in this regard: "What would you like me to call you?"; "Is it OK to meet with you today? Is now convenient for you?"; "Just let me know when you need a break"; 'May I come to see you again in order that we can finish this assessment?" Alternatively, the practitioner can offer choices-fixed and predetermined—that enhance the client's sense of having a say in what is going on and reduce the need to fight with the practitioner in order to achieve this (Harris, Attrill, & Bush, 2005). Queries such as the following can be helpful in this way: "Shall I call you Mr. Smith or John?"; "Shall we meet again this afternoon or tomorrow?" By appearing to give the client control over even quite minor matters, efforts by the client to take control over more substantial parts of the interview are likely to be diminished. This is especially likely to occur when choices are offered in the context of an overall interview style that emphasizes the centrality of the client's point of view and the practitioner's genuine curiosity about his or her situation.

Third, when resistance is encountered, the practitioner should consider switching from facts to feelings-since resistance usually has an emotional basis, and some degree of resistance is likely to arise in initial encounters with many clients (Morrison, 2014). In such circumstances, practitioners should strive to maintain a tone of voice that is warm and encouraging-perhaps speaking in a manner that is a little deeper, slower, and quieter—to enhance the client's perception of the interviewer's sincerity. The practitioner should also be sure to focus on the client's interests or strengths, as these are likely to constitute safe territory compared to the topic that triggered the resistance. Another useful approach is to discuss important subjects in a way that allows the client to "save face"-for example, in terms of what happened in the past as opposed to what is happening now, or what the client usually did rather than what he or she did on a particular occasion—prior to more specific enquiries. And finally, practitioners should strive to avoid meeting hostile resistance with responses that may deliberately or otherwise provoke guilt ("I'm only trying to help you"), anxiety ("If you don't talk about it, you'll never get out"), or more hostility ("Don't shout at me!") The use of counterprojection as a technique in such instances may be more suitable (Havens, 2007): For example, if a client states, "You
are useless—I don't know why I'm here," consider responding, "You feel that no one is helping you right now," rather than with a statement such as "I'm only trying to help you."

#### Detecting Deception

Some form of distortion "must be assumed to exist in all forensic interviews until it is disproven" (Meloy, 2005, p. 428). Clients may restrict or control the information they provide, or manipulate the practitioner in order to gain some form of perceived advantage either in the long term (e.g., a more favorable judgment about personality or future risk), or the short term (e.g., the pleasure of duping the interviewer). Practitioners must rely on being able to detect distortions within interviews and when comparing information provided by the client against information contained in clinical records. Therefore, detecting deception relies significantly on knowing the client and preparing for the interview: Fail to prepare, prepare to fail.

In addition, detecting deception relies on effective observation, which entails good eve contact with the client and avoiding excessive note taking during the session. Taking copious notes can result in two difficulties: First, if the practitioner's eyes are directed away from the client, key information (e.g., microexpressions of emotion) may be missed; and second, the client will lose the certainty that he or she is being closely scrutinized. Along these lines, practitioners need to be observant of the congruence of the client's presentation-the coherence of what the client says with how the client says it, and with what others have said about the same matter. However, practitioners also need to be observant-even vigilant-with respect to key but subtle deception "tells," such as a lack of contextual embedding, and an absence of reproduced conversations, unexpected complications, and attributions of another's mental state, all of which tend to occur more often in untruthful narratives than in truthful ones (Lee, Klaver, & Hart, 2008). In instances in which there is reason to doubt the truthfulness of a client's account, inquiries aimed at amplifying detail in these areas may generate opportunities for the detection of incongruence, if not outright inconsistency. In addition, maintaining good eye contact throughout exchanges in which dissimulation is suspected increases the cognitive load on the client (Vrij, Granhag, Mann, & Leal, 2011), making it harder for him or her to remember details provided on the first telling of a story or scenario (i.e., because, at that time, attention was focused on appearing credible and convincing, and on gauging the practitioner's belief in the reported information). In this way, probing for more details may more readily reveal errors. If such an exchange follows a period of "baseline" questioning—about neutral subjects—the contrast in the client's presentation between baseline and this more testing phase may be especially obvious and detectable.

To help practitioners detect deceptive accounts, Shepherd and Griffiths (2013) summarized types of problems frequently encountered in demanding interviews using the acronym ASSESS+: Account problems (e.g., missing detail, gaps, jumps, the absence of reasonably expected detail, nonspecific detail, sidesteps, inconsistency, contradictions, overly rehearsed statements, or narrative contrast); Sense problems (i.e., the account lacks credibility because it is improbable, impossible, nonsensical, or counter to reasonable behavior); Struggles to give detail (i.e., to go beyond the original story, the client repeats minimal nonspecific detail or claims an inability to provide further detail); Evasion (i.e., the client tries to change the topic, answers the question with a question, gives measured or evasive responses, blanks an echo probe, or sidesteps); Sabotaging behavior (i.e., the client argues, becomes angry or emotional, becomes abusive, threatens, refuses to be helped, refuses to cooperate); Significant expressive behavior (e.g., the client's speech about the topic at hand shows marked dysfluencies or deviations-such as alterations in rate of speech or pitch of voice, marked pauses before or when answering important questions, or more discursive speech-relative to communications about other topics); and context factors  $(\pm)$ , those variables that may have a bearing on the nature of the client's account (e.g., learning difficulties, or cross-cultural issues).

#### The Art of Challenge

The need to challenge statements by the client is a very common feature of interviews with individuals who have psychopathic traits (Kosson et al., 2000; Meloy, 2005). Challenges may be required to highlight inconsistencies within the client's account or differences between the client's account and statements by significant others. Challenges can generate a more accurate narrative, draw the client's attention to the detection of error, and provide opportunities to observe how a client responds when put under some pressure. Challengeing a client with psychopathic traits requires judgment and skill because a negative response could disrupt the interview process or, more seriously, create professional or personal risks for the practitioner (e.g., complaints or threats of litigation, verbal attack, or even physical assault).

There are at least four considerations in effective challenges with psychopathic clients. First, challenges are more likely to succeed in exposing inaccuracy and achieving reliability if the interviewer is well prepared and implements an interview strategy that is based on a range of credible information and on at least a basic understanding of the overall personality style of the client. Second, the practitioner should be aware of his or her own personality style when thinking about how to challenge the client. Practitioners who score high on the trait of Agreeableness are more likely to be able to challenge safely because of their natural nonconfrontational style (Miller, Rufino, Boccaccini, Jackson, & Murrie, 2011). However, such practitioners may be less comfortable personally with challenging psychopaths and may need more time to prepare and work up to this task. By contrast, practitioners low in Agreeableness (i.e., higher in antagonism) are likely to find challenges easier to undertake but may be prone to challenge clients prematurely.

Third, timing is important. Challenges are best left to the final part of the interview session or sessions. More broadly, working by a "rule of thirds" (Berger, 2008), interviews should entail three segments: The first third of the allotted interview time should focus on introductions and consent, agreement on objectives, rapport building, general information gathering, identification of hotspot topics, and so on; the second third should focus on commitment to detail, especially relating to hotspot topics; and the final third of the interview time should focus on challenges, review of details, and conclusions. Challenging too early may cause the client to close down and limit the practitioner's access to important information and detail. Challenges later in the session, after the client has provided considerable relevant detail, are less likely to produce a level of disengagement that compromises the objectives of the interview.

Finally, challenges can be graded in strength; they can be delivered in at least four levels of intensity (Logan, 2013). The most basic level is to imply that the client is not making him- or herself clear, but that the practitioner is at fault for failing to understand (e.g., "I didn't quite follow what you just said. Can you tell me again so that I can understand?"). Such a challenge invites the client to commit him- or herself to a restatement with potentially more detail, while keeping the level of confrontation to a minimum. The next level of challenge shifts the blame for a lack of clarity from the practitioner to a relevant third party (e.g., "I think we might have a problem here. I don't think the Parole Board is going to believe what you have just told me. Can you help me understand your point better so I can explain it to them clearly?"). Such an approach challenges the client to provide further explanation or detail, while retaining the interviewer's apparent neutrality; the client may become irritated at being asked for a restatement, but irritation tends to be directed toward the identified third party rather than the interviewer. A third level more directly locates the source of confusion in the client (e.g., "What you just told me doesn't make sense. Can you go through your explanation again and try to be clearer?"). Challenges at this level entail more obvious accusations of confusion or obfuscation, focusing on the client as the source of the practitioner's misunderstanding, and are consequently a higher risk strategy, to be used with greater caution. However, the highest risk strategy of all is the final level-a direct accusation of deception (i.e., "I don't believe that your account of what happened is truthful"). Such a challenge could be applied when the practitioner feels the need to strongly encourage, even provoke, the client into a response, such as when the client has exercised a flippant attitude toward the interview and practitioner, and has provided clearly incorrect information. As the strongest form of challenge-the "nuclear" option-direct accusations should be used sparingly and only when it is clear that the risks posed by the client to the practitioner (personal, professional) can be safely managed.

# Interviewing Male versus Female Psychopathic Clients

Gender differences in the expression of psychopathic personality traits are well documented and widely recognized by clinicians (Forouzan & Cooke, 2005; Kreis & Cooke, 2012; Logan & Weizmann-Henelius, 2012). Such gender differences are directly relevant to interview craft. While a detailed explanation of gender-aware interview strategies for clients with psychopathy is beyond the scope of this chapter, three key issues are of sufficient importance to be considered in brief.

First, men and women with psychopathic traits use subtly different strategies to exercise control over interview encounters-and practitioners' opinions and recommendations-especially in the early impression management stage and in relation to hotspot topics within the body of the interview. For example, compared to men, women with psychopathic traits are likely to use more varied, incongruent, and rapidly changing emotions to illustrate and punctuate their account of important events, such that it may be a challenge for the practitioner to follow the client's account without confusion or distraction. Also, while status and appearance are of importance to both psychopathic women and men-and a means by which they seek to influence others, including practitioners-women are more likely to emphasize aesthetic qualities (correlates of sexual attractiveness or hyperfemininity, which may be expressed through ostentatious makeup or hairstyles, revealing or otherwise striking clothing, fashion accessories, etc.) compared to men (Carlson, Naumann, & Vazire, 2011). By contrast, men are more likely than women to emphasize qualities relating to power, strength, or invulnerability, which may in turn be expressed by indicators of hypermasculinity (e.g., physical size and bearing; expensive, branded, and tailored clothing; flashy possessions such as expensive watches or cars). Therefore, practitioners should expect their psychopathic clients to try to manage the opinions being formed over the course of the assessment, and that men and women present themselves differently, emphasizing and exaggerating gender-specific attributes, in order to do so.

Second, women with psychopathic traits exercise good command over relational skills and aggression as a form of social control, and tend to use this as a strategy more frequently and competently than do men (Carlson et al., 2011). In general, psychopathic women manage their social network by influencing the opinions of others about key individuals-including themselves-through means of subtle persuasion, use of biased or erroneous accounts and explanations, and by controlling membership of "ingroup" and "outgroup" cliques by bestowing attention and favor or rejection and ostracism, respectively. The woman's motivation in doing so is to increase her sphere of influence, control, power, and status within the favored ingroup, and protect her growing interests and high ambitions. With this in mind, practitioners should anticipate that their female psychopathic clients will seek to closely observe and manage professional encounters to a greater extent and more subtly than do male psychopathic clients, and be prepared to test the opinions of such clients and the information they provide by examining collateral sources closely.

Finally, practitioners who seek to find in women the same psychopathic traits as they would expect to find in men, who treat women as if they are just funny-shaped men, are likely to overlook crucial evidence, underestimate symptom severity, and produce inadequate evaluations. Thorough preparation and an acceptance and understanding of gender differences in the expression of psychopathic traits are prerequisites for the effective detection of such traits (Logan & Weizmann-Henelius, 2012). In particular, practitioners need to prepare in order to cope with a range of tactics on the part of clients to influence their perceptions and opinions, to be equipped to detect the use of these tactics through evaluation of the content and manner of speech, along with awareness of incongruencies, and pay careful attention to rapport building as a means of maintaining engagement in the evaluation.

#### Summary and Implications for Research

In this first section of our chapter, we have considered the essential elements of interview craft as it applies to professional encounters with psychopathic clients. A great deal of the material presented has been gleaned from professional literatures on clinical and forensic or investigative interviewing. However, both of these fields lack a high level of empirical research, especially in their combined form as forensic clinical interviewing practice. Therefore, our key recommendation is that research be undertaken in this area, as a matter of necessity-in order to test and develop valid guidance for practitioners working with clients of the most challenging types, often in the most challenging of situations. At least five research priorities may be identified.

First, researchers should continue working to identify the range of tactics that show maximal effectiveness in eliciting information, both in controlled laboratory studies and in qualitative investigations with real-life practitioners and clients. Second, specific attention should be paid in future studies to the delineation of interview tactics that are effective for clients with differing personality presentations, including subtypes of psychopathic individuals (e.g., building on the work of Ackley et al., 2011; see also Hicks & Drislane, Chapter 13, this volume). Third, research should be carried out to evaluate the comparative strengths and weaknesses of clinical interviewers with differing personality styles (e.g., building on the work of Miller et al., 2011). Fourth, systematic research is needed to examine when and how tactics should be shifted when interviewing women compared to men, children or adolescents compared to adults, and clients with distinct ethnic and cultural backgrounds. Finally, the development of interview tactics most suitable for use with individuals who have committed or are at risk of committing acts of targeted violence (e.g., ideological terrorism, or affect-driven attacks) is a further area of research need.

Having provided a detailed analysis of the essential craft of effective clinical interviewing as applied to the assessment of psychopathic individuals—techniques and practices that allow the skilled assessor to delve beyond the "mask of sanity"—we now describe a new assessment-oriented conceptual model of the psychopathy construct, the CAPP (Cooke et al., 2004, 2012). The CAPP model can be viewed as providing a nuanced map of the psychological terrain that lies behind the mask of psychopathy. In the material that follows, we describe the development of the CAPP model and the growing evidence base for the CAPP as a framework for interview-based assessment of psychopathy.

# The CAPP

Over the past decade, together with colleagues Stephen Hart and Christine Michie, we have developed a new conceptual framework for psychopathy-the CAPP. The development of this conceptual framework was motivated by the need to generate an up-to-date procedure for measuring psychopathy that was potentially dynamic in the sense that it could detect change in symptoms across time. Operating from the CAPP conceptual framework, we have developed a number of assessment approaches, one of which is a thorough interview-based clinical assessment of the symptoms of psychopathic personality (Cooke et al., 2004, 2012). Structured assessment is the fundament upon which the craft of clinical interviewing is based. In developing the CAPP interview, the authors sought to advance understanding of psychopathic personality, while working to establish more effective methods for its assessment. In this section, we describe the primary principles shaping the development of the CAPP model and interview, and explain the strategies adopted to create the conceptual model, followed by a description of some of the growing evidence regarding the validity and utility of the model.

The adequacy of any measure is based directly on—and, importantly, inherently limited by—the definition of a clinical condition; fundamentally, construct explication guides the development and evaluation of measures (Blashfield & Livesley, 1991; Cronbach & Meehl, 1955). It is necessary to describe the conceptual topography that has to be mapped by measures, including different types of measures needed to characterize distinguishable aspects of a construct—in this case, psychopathy. The initial impetus for the development of the CAPP model was explicitly clinical, namely, the need to assess outcome in a treatment program for high-risk offenders with personality disorders (e.g., Duggan, 2011). Subsequently, the conceptual model guided the development of a semistructured clinical interview-the CAPP interviewthat has the potential to detect both the range and depth of psychopathic tendencies, as well as change in these tendencies over time.

#### CAPP Guiding Principles

Eight principles derived from literature on the development of psychological concepts and measures guided the development of the CAPP model (Blashfield & Livesley, 1991; Clark & Watson, 1995; Maraun & Peters, 2005; Smith, Fischer, & Fister, 2003). First, drawing on these sources, we believe the focus of a model should be on symptoms defined in terms of personality pathologystylistic variations among people—rather than departures from cultural or moral standards, such as specific criminal or antisocial behaviors (Skeem & Cooke, 2010). Second, the model should be comprehensive in its coverage, including all of a clinical condition's primary symptoms-not just a brief set of symptoms considered "good enough" for diagnostic purposes (cf. DSM-5; American Psychiatric Association [APA], 2013). Third, the model in our view should be clinical in content and focusthat is, both consistent with important clinical descriptions and suitable for clinical purposes, such as diagnostic, case, and risk formulation. Fourth, the model should reflect and capture the growing appreciation of the dynamic nature of personality and personality pathology (Tyrer, 2005). From this perspective, it is desirable to define symptoms in ways that facilitate assessment of change over time in the nature and severity of pathology. Fifth, the model should define symptoms in "atomistic"

terms-that is, at the basic level of discrete features of personality rather than high-level, complex, or blended features. For example, analysis of the definition of the item labeled "shallow affect" from the Psychopathy Checklist-Revised (PCL-R; Hare, 1991, 2003; Hare, Neumann, & Mokros, Chapter 3, this volume) suggests that it may be regarded as a blend of emotional experience (lack of emotional depth, anxiety, empathy, and pleasure), attachment difficulties (e.g., being detached, uncommitted, and uncaring), and problems of interpersonal dominance (e.g., being insincere). Sixth, in our view, the model should be lexical in nature, reflecting the theory that important differences in human transactions-including symptoms of personality and personality disorder-are likely to be encoded in natural language (Goldberg, 1993). Seventh, the model should be hierarchical in nature: Research on personality and personality pathology suggests that low-level symptoms typically have important theoretical or empirical associations that allow them to be clustered in meaningful ways. By adopting a hierarchical model, it is possible to ensure both bandwidth and precision in measurement. Eighth, we believe the conceptual model should be viewed as distinct from any particular measure. The conceptual model should guide the development of new measures, with a range of different measures based on the same conceptual model (Cronbach & Meehl, 1955; Maraun & Peters, 2005), and be susceptible to revision based on empirical findings for manifest measures. These principles were used to guide the building of the CAPP model.

#### **Building the Conceptual Model**

Model development in psychopathology is a conceptual process, in which validation is an empirical enterprise that feeds back into conceptualization (Cronbach & Meehl, 1955; Maraun & Peters, 2005). When explicating a conceptual model of psychopathology, we believe it important to first describe the content encompassed by the clinical condition in question, capturing all clinically relevant features yet purging the model of secondary or irrelevant content (Blashfield & Livesley, 1991; Clark & Watson, 1995; Smith et al., 2003). How is this achieved? We advocate a multimethod, multimodal approach in which the construct is captured through many processes: through literature reviews, expert opinions, analysis of relevant research findings, and direct observations of prototypical cases (Blashfield & Livesley, 1991). This is a "bottom-up" approach in contrast with the more common "top-down" approaches that have depended on one individual's conceptualization of a particular clinical condition. An inherent limitation of the top-down approach, as we conceive it, is that it depends on the insight, experience, and acumen of one individual. To illustrate this point as pertinent to psychopathy, Cleckley's (1941, 1982) conceptualization has been influential over many years. If this small and highly selective sample of patients were unrepresentative of cases in the population as a whole, or if Cleckley's assessment of these cases were idiosyncratic, then in our view his conceptualization would be faulty. When explicating a conceptual model of psychopathy, we believe that a bottom-up approach is advantageous, in that it allows for clarification of the nature and boundaries of the target construct and highlights limitations in both current models and current measures.

Working from this perspective, the CAPP model was developed in four stages. First, the clinical and research literatures were reviewed to identify primary symptoms—that is, symptoms thought to be central or prototypical, not as secondary or sequelae of psychopathy. Subsequently, subject matter experts consisting of experienced practitioners and researchers were consulted to ensure the completeness of the symptoms identified through literature review. Next, the primary symptoms were defined in terms of trait-descriptive adjectives. Finally, symptoms were categorized into distinct domains of psychological functioning. We now describe development of the CAPP in more detail (see also Cooke et al., 2012).

The classic clinical literatures on psychopathy were reviewed as one point of reference for the development of the CAPP. Rich clinical descriptions of psychopathic symptomatology have been provided by many scholars, such as Silvano Arieti (1963), Benjamin Karpman (1948), William and Joan McCord (1964), and Kurt Schneider (1958), as well as Hervey Cleckley (1941, 1982). These descriptions led to the development of various diagnostic criteria sets (e.g., DSM-5 [APA, 2013]; International Classification of Mental and Behavioral Disorders [ICD-10; World Health Organization, 1992]) and psychological tests designed to assess and diagnose psychopathic traits or cognate disorders (e.g., Gough, 1948; Hare, 1991, 2003; Lilienfeld & Andrews, 1996). A prodigious number of research studies carried out over the last 30 years and good summaries exist (e.g., Patrick, 2006). The CAPP developers reviewed all these available

sources, and discussed and debated what the clinical literature identified as the primary features of psychopathy. Equally important, the CAPP developers sought to clarify what putative features of psychopathy were *not* primary.

The next step in the development process was the completion of detailed semistructured interviews with 29 subject-matter experts, consisting of practitioners from diverse theoretical backgrounds who worked closely with patients exhibiting psychopathic personality traits. This was considered an important step because other measures of psychopathy have been developed for nonclinical purposes and may therefore lack clinical relevance and clinical credibility. Subject-matter experts were asked to list which symptoms they considered especially salient when evaluating clients with psychopathic traits; they were asked to consider both a recent client and clients in general.

As a next step in the process, rational criteria were applied to analyze the information collected from the reviews and interviews. This criterionbased conceptual analysis was iterative in nature, moving through several cycles of refinement.

These approaches to delineating the terrain of psychopathy generated a large number of candidate symptoms, many of them complex in nature. To parse these symptoms into more discrete, lowlevel features of personality, a lexical approach was used (Saucier & Goldberg, 2001). As noted previously, this approach is founded on the observation that phenotypic attributes of personality-and, by extension, features of pathological personality conditions-are captured by natural language (McCrae & Costa, 1995). The lexical hypothesis proposes that the degree to which particular attributes-for example, personality characteristicsare represented in a language is linked to their importance for transactions within that language. As such, the lexical approach provides a methodology for identifying dimensions of personality variation. Descriptions of, and distinctions among, people are captured in the form of trait-descriptive adjectives. From a clinical perspective, adjectives can be applied in varying ways to provide subtle and nuanced descriptions of personality attributes. The adjectival approach provides an empirical basis for the selection of variables for the study of personality, and in this case, personality disorder (Saucier & Goldberg, 2001). A further advantage is that the lexical hypothesis is neutral in relation to the mechanisms and processes that may underpin variations in the identified dimensions of phenotypic attributes.

In practical terms, each of the symptoms identified through the literature review and consultations with experts was considered and deconstructed into constituent trait-descriptive adjectives culled from a number of English dictionaries and thesauri. This was necessary because many of the symptoms identified in these ways were very complex. For example, definitions of items such as callous/lack of empathy or shallow affect in the PCL-R (Hare, 1991, 2003) comprise several hundred words that reflect multiple features of personality pathology (see below), and certain PCL-R items overlap with others in terms of content (Cooke & Michie, 2001). Once target symptoms were translated into trait-descriptive adjectives, each of these new symptoms was defined by "triangulation"—that is, by listing three other trait-descriptive adjectives that were all close synonyms. The use of converging adjective referents served to locate each target symptom effectively in semantic-conceptual "space"; consonant with the lexical-descriptive approach, common language referents in themselves (i.e., without accompanying definitions) were considered sufficient for this purpose. For example, the symptom antagonistic was defined by the adjectives "contemptuous," "disagreeable," and "hostile"; and the symptom manipulative was defined by the adjectives "devious," "exploitative," and "calculating." In total, 33 distinct symptoms were identified, each defined by three trait-descriptive adjectives. (In a few cases, a two- or three-word adjectival phrase was used instead of a single adjective.)

Some of the symptoms identified through the aforementioned process were clearly central to the clinical conceptualization of psychopathy; others were less so. Operating from the premise that it is important in model development to be overinclusive rather than restrictive, in order to ensure that all potentially relevant symptoms are included, a small number of symptoms about which subject matter-experts disagreed, such as *lacks pleasure* and *unstable self-concept*, were retained in the CAPP model. It was expected that validation processes could be used at a later date to refine the model by excluding any symptoms found to be irrelevant or peripheral to the construct.

#### Domains of Psychopathic Personality

Having identified and defined the symptom terrain of psychopathy, features considered relevant were grouped into domains reflecting basic psychological functions—in a manner consistent with the principle of hierarchical organization. Whereas evidence from the literature on the PCL-R suggested that symptoms of psychopathy in offender samples reflect at least three domains of psychological function (interpersonal, affective, and behavioral; Cooke & Michie, 2001; Cooke, Michie & Skeem, 2007; Skeem & Cooke, 2010; but see Hare et al., Chapter 3, this volume), a content evaluation of the CAPP symptom set suggested that a more refined and extended conceptualization of psychopathy domains was possible (see Figure 9.1). Rather than three domains, six were identified that appear generally consistent with past research on basic dimensions of personality and personality pathology: attachment, behavioral, cognitive, dominance, emotional, and self functions (Ashton et al., 2004; John & Srivastava, 1999; Millon & Davis, 1996).

The attachment domain encapsulates difficulties with interpersonal affiliation. These difficulties include the failure to form close, stable emotional bonds with others. The intimacy and acceptance that people seek to attain from others in interpersonal exchanges are central to the attachment domain. The attachment domain symptoms are detached, uncommitted, unempathic, and uncaring. The behavioural domain focuses on problems with the organization of goal-directed activities and behavior regulation, including the failure to establish adaptive strategies to deal with life tasks in a systematic, consistent, or planned manner. The behavioral domain symptoms are lacks perseverance, unreliable, reckless, restless, disruptive, and aggressive. The cognitive domain reflects problems with mental flexibility and adaptability. It focuses on mental actions and processes, including how the person focuses and allocates attention, encodes and processes information, organises thoughts, and makes attributions. The cognitive domain symptoms are suspicious, lacks concentration, intolerant, inflexible, and lacks planfulness.

The *dominance* domain reflects aberrant expressions of interpersonal agency, such as excessive status seeking, overassertiveness, and manipulation of others. At its center is the degree of power or control that people endeavor to achieve in interpersonal exchanges. The dominance domain symptoms are *antagonistic, domineering, deceitful, manipulative, insincere,* and *garrulous.* The *emotional* domain reflects problems with mood regulation, such as the tendency to exhibit shallow, labile emotions. It focuses on the tone, depth, and appropriateness of people's affective responses. The emotional domain symptoms are *lacks* 

anxiety, lacks pleasure, lacks emotional depth, lacks emotional stability, and lacks remorse. Finally, the self domain pertains to social roles and relations with others, and reflects problems with identity or individuality, such as self-centeredness and selfaggrandizement. The focus of the self domain is individuals' consciousness of their own identities, including awareness of their personality traits and schemas and of their salient abilities, qualities, and desires. The self domain symptoms are self-centered, self-aggrandizing, sense of uniqueness, sense of entitlement, sense of invulnerability, self-justifying, and unstable self-concept.

# Distinct Advantages of the CAPP Assessment Framework

Certain advantages of the CAPP assessment framework derive from the lexical approach on which it is based. For one thing, the lexical approach is highly efficient. Because symptoms are defined in terms of natural or lay language, complex definitions are not needed. The definition of all 33 symptoms in the CAPP required around 100 words; some definitions for single items of the PCL-R exceed 200 words. Triangulation provides nuanced definitions of symptoms and can provide graded expressions of the symptoms of interestfor example, unempathic ("uncompassionate," "callous," "cruel") or aggressive ("threatening," "bullying," "violent"). A further notable benefit is ease of communication. The use of natural language rather than context-bound terms (e.g., "revocation of conditional release" or "parasitic lifestyle") means that the recipients of reports are more likely to comprehend their contents and implications.

In addition, using the lexical approach as the basis of the CAPP conceptualization allows complex symptoms from certain measures to be parsed into their constituent elements, thereby enabling the clarification and specification of their clinical meaning for an individual patient. For example, when the definition of the PCL-R item callous/lack of empathy is reviewed, it can be seen to be multidimensional; that is, a rating of this single item combines characteristics across multiple conceptual domains. Because of this inherent complexity, positive ratings on callous/lack of empathy can be assigned for differing reasons (i.e., based on alternative behavioral tendencies). When this item is translated into CAPP terms, it can be seen to cross two domains-attachment and emotional-and to encompass the CAPP symptoms of detached, unempathic, uncommitted, and uncaring, along with



FIGURE 9.1. Schematic depiction of the CAPP model, showing domains of psychological functioning, specific symptoms within each domain, and trait-descriptive adjectives for each specific symptom.

lacks anxiety and lacks emotional depth. This separation provides for greater clarity and precision in characterizing tendencies of this type. Similarly, concepts such as *impulsivity*, which are commonly seen as complex, can be parsed into more homogenous symptoms, from three domains in the case of the CAPP framework: *behavioral* (*restless*), *cognitive* (*lacks concentration*, *lacks planfulness*), and *emotional* (*lacks emotional stability*). In addition to enhancing specificity and clarity of symptom characterization, the increased precision afforded by the CAPP model may yield incremental validity over alternative diagnostic procedures currently in use.

A further advantage of the CAPP assessment framework is its focus on open concepts, that is, concepts not defined in terms of fixed and restricted sets of behavioral indicators. Specifically, features of psychopathy are defined in the CAPP assessment model using trait-descriptive adjectives rather than specific behavioral exemplars such as those in DSM-5 (e.g., being irritable and aggressive, as suggested by frequent assaults or physical fights; APA, 2013). This focus on open concepts means that CAPP symptom definitions are not tailored for use in selected contexts (e.g., community vs. institutional), with specific groups of people (e.g., people of a certain age, gender, or culture), or across certain time horizons (e.g., past 6 months vs. past 2 years vs. lifetime). Instead, CAPP symptoms have broad application.

Yet another advantage of the CAPP assessment framework is that its trait descriptors can be readily understood by professionals and laypeople alike. This feature allows systematic tests of the lexical hypothesis, for example, studies focusing on whether laypeople have the capacity to identify features of salient personality pathology—as would be expected of members of a highly social species. It also provides a method for assessing psychopathy in nonclinical settings, such as the workplace.

#### From Model to Measures

Having formulated the conceptual framework in this way, the CAPP model was then operationalized by development specific assessment protocols. These protocols provide vehicles for subjecting the conceptual model to empirical study and validation (Edwards, 2003). The distinction between a *measure* and a *construct* is often misunderstood, with the score on a fallible test being confused with the construct. The CAPP system explicitly recognizes this distinction and seeks to maintain it.

The terrain of a psychological constructs can be mapped in differing ways depending on the purposes of assessment. With this in mind, the CAPP originators developed a range of approaches for assessing psychopathic personality features. In addition, the operationalization of the CAPP model in the interview domain was intended to facilitate a number of the evaluation strategies highlighted in the first part of this chapter, including the ordering of interview questions from less to more contentious topics, the use of a simple and open questioning style, and so on. The CAPP approach to assessment as described in this section provides a good fit to what we described as "principles of good clinical practice," in terms of a multisource, multimethod evaluation that has a clear structure, is hierarchical (i.e., progresses from illustrative indicators to symptoms), and examines multiple domains of functioning, with separation between extremity of traits and dysfunction.

The CAPP interview protocol utilizes differing sources of available information to characterize the extent to which an examinee exhibits features of psychopathy. A review of institutional file records is first undertaken, followed by a detailed semistructured interview with the client, designed to yield information pertaining to each of the trait descriptors within the CAPP model. As described earlier, the CAPP interview focuses on 33 symptomatic features, each scored using three trait-descriptive adjectives. The client is prompted to discuss each symptom-related area through one or more starter questions, and responses from the client are followed up by a series of more directive probes and interview techniques, all focused on a specified time period (e.g., the past 6-12 months) depending on the purpose of the assessment. Four-point ratings are made of the degree to which traits demarcated by descriptive adjectives are present, based on the evidence obtained and guided by a set of illustrative indicators for each symptom, developed with input from expert psychopathy assessors. The illustrative indicators describe how the symptom and its associated trait-descriptive adjectives might be evidenced in the examinee. For example, the individual may display evidence of self-aggrandizement by only talking to important people, taking on the role of spokesperson, being dismissive of the needs of those whom he or she considers to be beneath him or her, or talking up actual or perceived accomplishments but avoiding discussion of any failings. Issues including the effects of gender, age, and culture are addressed through the selection

of particular illustrative indicators. Although not part of the model, these indicators serve to further anchor the assessment of the symptom within the client's context; the specifics of behavioral indicators within a high-security setting, for example, may be different from those in a community setting.

Subsequent to the completion of the interview, practitioners review their ratings of trait-descriptive adjectives using client-generated information from the interview in conjunction with file information. The assessor is prompted to rate the presence and strength of each of the 33 CAPP symptoms on a 7-point global scale. Symptom ratings-and the more detailed ratings of linked traitdescriptive adjectives-are then used as the basis for a formulation relating to symptom extremity and functional impairment, which in turn is used to guide recommendations about interventions, risk management, and other clinical decisions. The distinction between trait extremity and functional impairment is important therapeutically; extreme traits do not necessarily lead to problems; indeed, they may lead to enhanced functioning and adaptation in certain settings (Lykken, 2006).

The CAPP Informant Rating Form was developed after creation of the interview protocol. This form of the CAPP entails structured ratings of trait-descriptive adjectives for the differing CAPP symptoms by informants with extensive knowledge of the client, guided by the same illustrative indicators used in the CAPP interview. This informant-generated assessment is intended as an adjunct to the interview protocol and provides an alternative perspective on the presence of psychopathic traits in the client that can supplement the practitioner's interview-based assessment. Information derived from the interview and informant rating protocols together provides a more comprehensive picture of psychopathic symptomatology exhibited by the client. However, it should be acknowledged that there are occasions in which the use of one or the other format may be preferable to the use of both—such as when a client refuses to undergo the CAPP interview or, indeed, engage with the practitioner at all.

The standard temporal focus of both the CAPP interview and CAPP Informant Rating Form is mainly on the previous 6–12 months. However, each of these methods of evaluation has the flexibility to be adapted to whatever time frame is most relevant to the particular setting in which the client is being seen, and to the client's particular clinical problems.

# Evaluating the Conceptual Model: Empirical Findings

#### Content Validity

A primary strength of the CAPP model noted earlier is that the trait descriptors it uses are readily understood by researchers and clinicians alike. This advantage can be utilized to evaluate the content validity of the model through prototypicality studies. Prototypes are the clearest referent for a concept in that they exhibit the most salient features of members of the category (Rosch, 1999). Members of the category must have some of the prototype's features but will not necessarily possess all features. However, the more a category member resembles the prototype, the more that member exemplifies the construct (Rosch, 1999). Prototypicality studies can be applied to broaden the bottom-up approach applied to model development. They evaluate the comprehensiveness of a model. However, they can also differentiate among symptoms that are most central to the construct and those that lie at the margins-or outside its scope.

Kreis, Cooke, Michie, Hoff, and Logan (2012) carried out a prototypicality study using the English version of the CAPP model. One hundred thirty-two mental health professionals rated the prototypicality of the 33 CAPP symptoms along with nine foil symptoms (i.e., behavioral tendencies considered uncharacteristic of psychopathy, such as shy, considerate, conscientious). Ratings were carried out both for psychopathic clients in general, and for a specific client with psychopathic traits (Kreis et al., 2012). Nearly all the CAPP symptoms were viewed as "highly" or "very highly" prototypical of psychopathy; only three symptoms were rated as being of medium or low prototypicality. Smith, Edens, Clark, and Rulseh (2014) reported parallel findings for ratings obtained in the United States from individuals reporting for jury duty. Moving from studies in English, identical results have been achieved with both mental health professionals and samples of lay individuals when prototypical studies have been carried out with translations of the CAPP model (e.g., into Norwegian: Hoff, Rypdal, Mykletun, & Cooke, 2012; into German: Stoll, Heinzen, Köhler, & Huchzermeier, 2011; into Persian: Shariat, personal communication, August 28, 2012; into Castillan: Flórez et al., 2014; and into Swedish: Sörman et al., 2014).

In other work, Kreis and Cooke (2011) demonstrated that CAPP symptoms are viewed as being broadly gender neutral. Using a parallel instrument, the Comprehensive Assessment of Borderline Personality (CABP), Viljoen and colleagues (2015) presented evidence that psychopathy and borderline personality are distinct disorders rather than gender-linked variants of the same disorder. These studies lend support to our conceptual analysis of psychopathy as a clinical condition.

#### International Translations

Another, indirect test of the CAPP conceptual model is provided by the process of translation. The greater the linguistic distance from the source language-English-the more rigorous the test of the model that translation provides for (Saucier & Goldberg, 2001). At the time of this writing, translations into 15 languages are complete (e.g., French, German, Spanish, Italian, Danish, Russian, Lithuanian, Persian, Polish, Hungarian, Afrikaans, Hebrew) and translations into a further eight languages are underway (e.g., Japanese, Thai, Mandarin, Malay). Research is ongoing with these versions. Experience indicates that while the process of translation is challenging, similar networks of trait-descriptive adjectives representing symptomatic features of psychopathy can be found within these languages (e.g., Hoff et al., 2014; Stoll et al., 2011).

# Evaluating Operationalizations of the Model: Empirical Findings

#### Reliability

Both the internal consistency and interrater reliability of CAPP interview lifetime ratings have been evaluated in Danish adult forensic psychiatric patients (Pedersen, Kunz, Elsass, & Rasmussen, 2010) and in Canadian violent young serious offenders (Dawson, McCuish, Hart, & Corrado, 2012; McCormick, Corrado & Hart, 2008); other work has evaluated reliabilities of CAPP interview 6-month ratings in adult forensic psychiatric patients and prisoners in the United Kingdom (Cooke, 2011; Cooke, Hart, Michie, & Logan, 2016).

#### Internal Structure

In terms of the internal structure of its items, analysis of CAPP interview data from 315 U. K. prisoners and psychiatric patients indicate that (1) all but two constituent symptoms (*restless* and *lacks pleasure*) are underpinned by one major component; (2) the trait-descriptive adjectives for each symptom cohere together in a unidimensional manner, and (3) symptoms within each of the six CAPP domains also exhibit unidimensionality. As discussed by Cooke (2011), similar structural patterns for CAPP interview lifetime ratings have been found by Corrado and colleagues (Dawson et al., 2012; McCormick et al., 2008) in a Canadian young offender sample, and by Pedersen and colleagues (2010) in an adult forensic mental health patient sample. Taken together, these findings indicate unidimensional measurement for the CAPP interview at both symptom and domain levels.

More recently, Sellbom, Cooke, and Hart (2015) modeled self-ratings of CAPP traits provided by a large sample of community-dwelling participants using a bifactor approach, and demonstrated a strong general factor underpinning these self-ratings. The rank-order correlation between loadings of the CAPP traits on this general factor and prototypicality ratings of these traits by experts (Kreis et al., 2012) was .76. Findings from this study provide further evidence of content validity given the very different conceptual and empirical procedures used to obtain the ratings.

#### Criterion-Related Validity

With regard to validation evidence, investigations of the concurrent validity of the CAPP interview in relation to the PCL-R (Hare, 1991, 2003) and its screening (PCL:SV; Hart, Cox, & Hare, 1995) and youth versions (PCL:YV; Forth, Kosson & Hare, 2003) have been undertaken, respectively, by Cooke (2011; Cooke et al., 2016), Pedersen and colleagues (2010), and Corrado and colleagues (2007). Illustrative of findings from this work are data from Cooke (2011) and Cooke and colleagues (2016), who evaluated the capacity of the six CAPP domain scores and the three primary facets of the PCL-R to predict scores on Facet 4 of the PCL-R, an index of antisocial and criminal behavior. Stepwise regression analyses demonstrated that the CAPP behavioral domain score accounted for more variance in PCL-R Facet 4 than any of the three primary PCL-R facet scores. This is particularly notable given that the CAPP ratings were based on the previous 6 months, whereas the PCL-R ratings were based on a lifelong time frame. Additionally, using canonical correlation analysis, Cooke and colleagues demonstrated that the CAPP domain scores accounted for somewhat more variance in the PCL-R facets than vice versa: The canonical-analysis-based redundancy coefficient for CAPP Institutional Rating Scale (IRS) scores predicting PCL-R scores was .40, whereas

the redundancy coefficient for PCL-R scores predicting CAPP-IRS scores was .32.

In terms of predictive validity, Pedersen and colleagues (2010) reported that the CAPP was comparable to the PCL:SV when predicting both violent and nonviolent crime. These investigators studied the entire population of patients discharged from a forensic psychiatric unit in Denmark over a 2-year period; 148 patients were assessed and followed-up over a 5-year period, with data pertaining to reoffending retrieved from the country's National Crime Register. Predictive accuracy for crimes of each type (violent, nonviolent) was assessed using the area under the curve (AUC) statistic. The two measures of psychopathy showed comparable AUC values in each case: For the PCL-R, AUCs for violent and nonviolent offenses were .73 and .69, respectively; for the CAPP-IRS, AUCs for violent and nonviolent offenses were .70 and .71, respectively.

#### From Construct to Measures—and Back

An inductive approach was explicitly adopted for the construction of the CAPP measures, as understanding of the underlying nature, scope, and structural organization of a hypothetical construct is an evolving process (Smith et al., 2003). As described by Strauss and Smith (2009), empirical tests of partially developed theories inform revision and clarification of those theories, leading to progressive cycles of construct refinement and improved validation research. In this way, psychological science progresses through iterative, back-and forth refinement of both constructs and measures (Blashfield & Livesley, 1991; Cronbach & Meehl, 1955; Strauss & Smith, 2009)-with new findings clarifying existing models and calling for revision of existing measures or formulation of new measures.

From this perspective, the CAPP interview and informant rating protocols can be viewed as provisional operationalizations of the CAPP model—amenable to revision based on accumulating knowledge of their relations with psychopathyrelevant criterion variables, and the implications these observed relations have for (1) the effectiveness of these assessment protocols as representations of the conceptual model, and (2) the effectiveness of the CAPP model itself in accounting for theory-relevant criterion variables. Results pertaining to the CAPP interview protocol, described in the preceding section, provide initial evidence for its effectiveness in assessing thematic domains of the model and distinguishable symptoms within these domains. Findings regarding the informant rating protocol are limited at present, but the nonproprietary nature of this version (along with the interview form) and its availability in differing translations, provide a strong basis for parallel empirical work. Operating from a construct-oriented view of psychopathy, we anticipate that continuing empirical work on these alternative CAPP assessment forms will result in progressive refinements to these instruments and the model on which they are based—and ultimately to reshaping of psychopathy as a clinical–empirical concept.

#### **Clinical Utility**

The CAPP assessment approach is fundamentally idiographic; as Millon (2011) remarked, "It is only the unique way in which the personality construct is seen in real patients that is ultimately of clinical value" (p. 296). The CAPP model and its assessment using the CAPP interview and/or the CAPP informant rating form facilitates clinical formulation by providing a precise, nuanced, and systematic framework for characterizing the underlying sources of a client's presenting problems, and a natural-language-based vehicle for communicating those problems and their consequences to the client and others. As such, the CAPP assessment process endeavors to capture the "lived experience" of psychopathy: It provides a means for characterizing the client's individual personality tendencies in detail, and therefore generating hypotheses about his or her motivations and probable responses in situations of interest, either in the past or the future. The CAPP interview, if implemented according to the principles of "good interview craft" described in the first major section, facilitates an engagement with the client that can be built upon over time to maximize information gain and optimize clinical formulation. From this perspective, the CAPP assessment system holds strong potential for use in evaluations of personality pathology and risk, as well as criminal responsibility (Cooke, 2010).

### **Concluding Comments**

We began this chapter by arguing that psychopathy remains an important concept in general psychological and forensic practice despite persisting controversies regarding how it should be defined, measured, studied, and addressed clinically. There is little doubt that assessing clients who exhibit symptoms of this condition in a precise and clinically useful manner represents one of the most challenging tasks undertaken by the practitioner. We have described the general technique (i.e., craft) by which interview-based assessments can be conducted competently and with optimal effectiveness. Our strongly held view is that competent assessments of psychopathy require both structure and process—a clear map of the terrain of psychopathy, together with the skills to properly evaluate what is observed and elicited. We maintain that the former cannot be effective without the latter. We have described a conceptual map of the terrain that we believe lies behind the mask of sanity, in the form of the CAPP model. Based on accumulated empirical evidence to date, we believe this approach has strong potential utility for general clinical, forensic/correctional, and research settings. Assessing psychopathic personality is a highly specialized undertaking, which in our view remains in need of considerable refinement, and our hope is that this chapter will promote further systematic efforts in this crucially important direction.

#### REFERENCES

- Ackley, C. N., Mack, S. M., Beyer, K., & Erdberg, P. (2011). Investigative and forensic interviewing: A personality-focused approach. Boca Raton, FL: CRC Press.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed). Arlington, VA: Author.
- Arieti, S. (1963). Psychopathic personality: Some views on its psychopathology and psychodynamics. Comprehensive Psychiatry, 4, 301–312.
- Ashton, M. C., Lee, K., Perugini, M., Szarota, P., de Vries, R. E., Di Blas, L., et al. (2004). A six-factor structure of personality-descriptive adjectives: Solutions from psycholexical studies in seven languages. *Journal of Personality and Social Psychology*, 86, 356– 366.
- Berger, J. (2008). Ways of seeing. London: Penguin.
- Blackburn, R., Donnelly, J. P., Logan, C., & Renwick, S. J. (2004). Convergent and discriminative validity of interview and questionnaire measures of personality disorder in mentally disordered offenders: A multitrait–multimethod analysis using confirmatory factor analysis. Journal of Personality Disorders, 18, 129–150.
- Blashfield, R. K., & Livesley, W. J. (1991). Metaphorical analysis of psychiatric classification of a psychological test. *Journal of Abnormal Psychology*, 100, 262–270.
- Carlson, E. N., Naumann, L. P., & Vazire, S. (2011). Getting to know a narcissist inside and out. In W.

K. Campbell & J. D. Miller (Eds), The handbook of narcissism and narcissistic personality disorder: Theoretical approaches, empirical findings, and treatments (pp. 285–299). Hoboken, NJ: Wiley.

- Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in objective. *Psychological Assessment*, 7, 309–319.
- Cleckley, H. (1941). The mask of sanity. St Louis, MO: Mosby.
- Cleckley, H. (1982). The mask of sanity (6th ed.). St Louis, MO: Mosby.
- Cooke, D. J. (2010). Personality disorder and violence: Understand violence risk: An introduction to the Special Section Personality Disorder and Violence. *Journal of Personality Disorders*, 24, 539–550.
- Cooke, D. J. (2011, November). *Psychopathy: Capturing an elusive concept.* Keynote Address presented at the 2nd Bergen Conference on the Treatment of Psychopathy, Bergen, Norway.
- Cooke, D. J. (2016). A general approach to clinical assessment of psychopathy. In M. K. F. Kreis, H. A. Hoff, H. Belfrage, & S. D. Hart (Eds.), *Psykopati* [Psychopathy] (pp. 125–144). Copenhagen: Hans Reitzels Forlag.
- Cooke, D. J., Hart, S. D., Logan, C., & Michie, C. (2004). Comprehensive Assessment of Psychopathic Personality—Institutional Rating Scale (CAPP-IRS). Unpublished manual, Glasgow Caledonian University, Glasgow, UK.
- Cooke, D. J., Hart, S. D., Logan, C., & Michie, C. (2012). Explicating the construct of psychopathy: Development and validation of a conceptual model, the Comprehensive Assessment of Psychopathic Personality (CAPP). International Journal of Forensic Mental Health, 11, 242–252.
- Cooke, D. J., Hart, S. D., Michie, C., & Logan, C. (2016). Structural and construct validity of the Comprehensive Assessment of Psychopathic Personality—Institutional Rating Scale. Unpublished manuscript, University of Bergen, Bergen, Norway.
- Cooke, D. J., & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment*, 13, 171–188.
- Cooke, D. J., Michie, C., & Skeem, J. L. (2007). Understanding the structure of the Psychopathy Checklist—Revised: An exploration of methodological confusion. British Journal of Psychiatry, 190 (Suppl. 49), S39–S50.
- Corrado, R. R., McCuish, E. C., Hart, S. D., & McCormick, A. V. (2007). The Comprehensive Assessment of Psychopathic Personality (CAPP): Supplemental guide for youth. Burnaby, BC, Canada: School of Criminology, Simon Fraser University.
- Craig, R. J. (Ed). (2005). Clinical and diagnostic interviewing. Lanham, MD: Aronson.
- Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin*, 52, 281–302.
- Dawson, S. E., McCuish, E. C., Hart, S. D., & Cor-

rado, R. R. (2012). Critical issues in the assessment of adolescent psychopathy: An illustration using two case studies. *International Journal of Forensic Mental Health*, 11, 63–79.

- Duggan, C. (2011). Dangerous and severe personality disorder. British Journal of Psychiatry, 198, 431–433.
- Edwards, J. R. (2003). Construct validation in organizational behavior research. In J. Greenberg (Ed.), Organizational behavior: The state of the science (2nd ed., pp. 327–372). Mahwah, NJ: Erlbaum.
- Fisher, R. P., & Geiselman, R. E. (1992). Memory-enhancing techniques for investigative interviewing: The cognitive interview. Springfield, IL: Charles C Thomas.
- Flórez, G., Casas, A., Kreis, M. K., Forti, L., Martínez, J., Fernández, J., et al. (2014). A prototypicality validation of the Comprehensive Assessment of Psychopathic Personality (CAPP) model Spanish version. *Journal of Personality Disorders*, 29, 707–718.
- Forouzan, E., & Cooke, D. J. (2005). Figuring out la femme fatale: Conceptual and assessment issues concerning psychopathy in females. Behavioural Sciences and the Law, 23, 765–768.
- Forth, A. E., Kosson, D. S., & Hare, R. D. (2003). Hare Psychopathy Checklist: Youth Version (PCL:YV). Tonawanda, NY: Multi-Health Systems.
- Frank, M. G., Yarbrough, J. D., & Ekman, P. (2006). Investigative interviewing and the detection of deception. In T. Williamson (Ed.), *Investigative interviewing: Rights, research, regulation* (pp. 229–256). Cullompton, UK: Willan.
- Goldberg, L. R. (1993). The structure of phenotypic personality traits. American Psychologist, 48, 26–34.
- Gough, H. G. (1948). A sociological theory of psychopathy. American Journal of Sociology, 53, 359–366.
- Hare, R. D. (1991). Hare Psychopathy Checklist—Revised: Technical manual. Toronto: Multi-Health Systems.
- Hare, R. D. (2003). Hare Psychopathy Checklist—Revised: Technical manual (2nd ed.). Toronto: Multi-Health Systems.
- Harris, D., Attrill, G., & Bush, J. (2005). Using choice as an aid to engagement and risk management with violent psychopathic offenders. *Issues in Forensic Psy*chology, 5, 144–151.
- Hart, S. D., Cox, D. N., & Hare, R. D. (1995). Manual for the Hare Psychopathy Checklist—Revised: Screening version. Toronto: Multi-Health Systems.
- Havens, L. (2007). Approaching the mind in clinical interviewing: The techniques of soundings and counter-projection. *Psychiatric Clinics of North America*, 30, 145–156.
- Hoff, H. A., Rypdal, K., Hystad, S. W., Hart, S. D., Mykletun, A., Kreis, M. K. F., et al. (2014). Cross-language consistency of the Comprehensive Assessment of Psychopathic Personality (CAPP) model. Personality Disorders: Theory, Research, and Treatment, 5, 356–368.
- Hoff, H. A., Rypdal, K., Mykletun, A., & Cooke, D. J. (2012). A prototypicality validation of the Compre-

hensive Assessment of Psychopathic Personality model (CAPP). Journal of Personality Disorders, 26, 414–427.

- John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed., pp. 102–138). New York: Guilford Press.
- Karpman, B. (1948). The myth of psychopathic personality. American Journal of Psychiatry, 104, 523–534.
- Kosson, D. S., Gacono, C. B., & Bodholdt, R. H. (2000). Assessing psychopathy: Interpersonal aspects and clinical interviewing. In C. B. Gacono (Ed.), The clinical and forensic assessment of psychopathy: A practitioner's guide (pp. 203–230). Mahwah, NJ: Erlbaum.
- Kreis, M. K., & Cooke, D. J. (2011). Capturing the psychopathic female: A prototypicality analysis of the Comprehensive Assessment of Psychopathic Personality (CAPP) across gender. *Behavioral Sciences and the Law*, 29, 634–648.
- Kreis, M. K. F., & Cooke, D. J. (2012). The manifestation of psychopathic traits in women: An exploration using case examples. *International Journal of Forensic Mental Health*, 11, 267–279.
- Kreis, M. K. F., Cooke, D. J., Michie, C., Hoff, H. A., & Logan, C. (2012). The Comprehensive Assessment of Psychopathic Personality (CAPP): Content validation using prototypical analysis. *Journal of Personality Disorders*, 26, 402–413.
- Lee, Z., Klaver, J. R., & Hart, S. D. (2008). Psychopathy and verbal indicators of deception in offenders. Psychology, Crime and Law, 14, 73–84.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in non-criminal populations. *Journal of Personality Assessment*, 66, 488–524.
- Logan, C. (2013). Risk assessment: Specialist interviewing skills for forensic practitioners. In C. Logan & L. Johnstone (Eds.), *Managing clinical risk: A guide to effective practice* (pp. 259–292). Oxford, UK: Routledge.
- Logan, C., & Weizmann-Henelius, G. (2012). Psychopathy in women: Presentation, assessment and management. In H. Häkkänen-Nyholm & J. O. Nyholm (Eds.), *Psychopathy and law* (pp. 99–125). Chichester, UK: Wiley.
- Lykken, D. T. (2006). Psychopathic personality: The scope of the problem. In C. Patrick (Ed.), *Handbook* of psychopathy (pp. 3–13). New York: Guilford Press.
- Lyon, D. R., & Ogloff, R. P. (2000). Legal and ethical issues in psychopathy assessment. In C. B. Gacono (Ed.), The clinical and forensic assessment of psychopathy: A practitioner's guide (pp. 139–174). Mahwah, NJ: Erlbaum.
- Maraun, M. D., & Peters, J. (2005). What does it mean that an issue is conceptual in nature? *Journal of Per*sonality Assessment, 85, 128–133.
- McCord, W., & McCord, J. (1964). The psychopath: An essay on the criminal mind. Princeton, NJ: Van Nostrand.

- McCormick, A., Corrado, R., & Hart, S. D. (2008, July). Inter-rater reliability and internal consistency of the Comprehensive Assessment of Psychopathic Personality among incarcerated young offenders. Paper presented at the 8th International Association of Forensic Mental Health Services (IAFMHS) Annual Conference, Vienna, Austria.
- McCrae, R. R., & Costa, P. T. (1995). Trait explanations in personality psychology. European Journal of Personality, 9, 231–252.
- McGrath, R. J. (1990). Assessment of sexual aggressors: Practical clinical interviewing strategies. Journal of Interpersonal Violence, 5, 507–519.
- Meloy, J. R. (2005). The forensic interview. In R. J. Craig (Ed.), Clinical and diagnostic interviewing (pp. 422– 443). Lanham, MD: Aronson.
- Miller, A. K., Rufino, K. A., Boccaccini, M. T., Jackson, R. L., & Murrie, D. C. (2011). On individual differences in person perception: Raters' personality traits relate to the Psychopathy Checklist—Revised scoring tendencies. Assessment, 18, 253–260.
- Millon, T. (2011). Classifying personality disorders: An evolution-based alternative to an evidence-based approach. *Journal of Personality Disorders*, 25, 279–304.
- Millon, T., & Davis, R. D. (1996). *Disorders of personality* DSM-IV and beyond. New York: Wiley.
- Morrison, J. (2014). *The first interview* (4th ed.). New York: Guilford Press.
- Patrick, C. J. (Ed.). (2016). Handbook of psychopathy. New York: Guilford Press.
- Pedersen, L., Kunz, C., Elsass, P., & Rasmussen, K. (2010). Psychopathy as a risk factor for violent recidivism: Investigating the Psychopathy Checklist Screening Version (PCL:SV) and the Comprehensive Assessment of Psychopathic Personality (CAPP) in a forensic psychiatric setting. International Journal of Forensic Mental Health, 9, 308–315.
- Poythress, N. G., & Petrila, J. P. (2010). PCL-R psychopathy: Threats to sue, peer review, and potential implications for science and law: A commentary. International Journal of Forensic Mental Health, 9, 3–10.
- Rogers, C. R. (1942). *Counseling and psychotherapy*. Boston: Houghton Mifflin.
- Rogers, R. (2001). Handbook of diagnostic and structured interviewing. New York: Guilford Press.
- Rosch, E. (1999). Principles of categorization. In E. Margolis & S. Laurence (Eds.), Concepts: Core readings (pp. 189–206). Cambridge, MA: MIT Press.
- Saucier, G., & Goldberg, L. R. (2001). Lexical studies of indigenous personality factors: Premises, products, and prospects. *Journal of Personality Disorders*, 69, 847–879.
- Schneider, K. (1958). Psychopathic personalities. London: Cassell.
- Sellbom, M., Cooke, D. J., & Hart, S. D. (2015). Construct validity of the Comprehensive Assessment of Psychopathic Personality (CAPP) concept map: Get-

ting closer to the core of psychopathy. International Journal of Forensic Mental Health, 14, 172–180.

- Shea, S. C. (1998). Psychiatric interviewing: The art of understanding (2nd ed). Philadelphia: Saunders.
- Shea, S. C. (Ed.). (2007). Clinical interviewing: Practical tips from master clinicians [Special issue]. Psychiatric Clinics of North America, 30, 145–322.
- Shepherd, E., & Griffiths, A. (2013). Investigative interviewing: The conversation management approach (2nd ed.). Oxford, UK: Oxford University Press.
- Skeem, J. L., & Cooke, D. J. (2010). Is criminal behavior a central component of psychopathy?: Conceptual directions for resolving the debate. *Psychological As*sessment, 22, 433–445.
- Smith, G. T., Fischer, S., & Fister, S. (2003). Incremental validity principles in test construction. *Psychological Assessment*, 15, 467–477.
- Smith, S. T., Edens, J. F., Clark, J., & Rulseh, A. (2014). "So, what is a psychopath?": Venireperson perceptions, beliefs, and attitudes about psychopathic personality. *Law and Human Behavior*, 38, 490–500.
- Sommers-Flanagan, J., & Sommers-Flanagan, R. (2014). Clinical interviewing (5th ed.). Hoboken, NJ: Wiley.
- Sörman, K., Edens, J. F., Smith, S. T., Svensson, O., Howner, K., Kristiansson, M., et al. (2014). Forensic mental health professionals' perceptions of psychopathy: A prototypicality analysis of the Comprehensive Assessment of Psychopathic Personality in Sweden. *Law and Human Behavior*, 38, 405–417.
- Stoll, E., Heinzen, H., Köhler, D., & Huchzermeier, C. (2011). Comprehensive Assessment of Psychopathic Personality (CAPP): Validity and practicability of the German version. Frankfurt am Main, Germany: Verlag für Polizeiwissenschaft.
- Strauss, M. E., & Smith, G. T. (2009) Construct validity: Advances in theory and methodology. Annual Review of Clinical Psychology, 5, 1–25.
- Sullivan, H. S. (1970). The psychiatric interview. New York: Norton.
- Tyrer, P. (2005). Temporal change: The third dimension of personality disorder. *Journal of Personality Disorders*, 19, 573–580.
- Viljoen, S., Cook, A. N., Lim, Y. L., Layden, B. K., Bousfield, N. K., & Hart, S. D. (2015). Are psychopathic and borderline personality disorder distinct, or differently gendered expressions of the same disorder?: An exploration using concept maps. *International Journal* of Forensic Mental Health, 14, 267–279.
- Vrij, A., Granhag, P. A., Mann, S., & Leal, S. (2011). Outsmarting the liars: Toward a cognitive lie detection approach. *Current Directions in Psychological Science*, 20, 28–32.
- World Health Organization. (1992). The ICD-10 classification of mental and behavioural disorders: Clinical descriptions and diagnostic guidelines. Geneva: Author.
- Yeschke, C. L. (2002). The art of investigative interviewing: A human approach to testimonial evidence (2nd ed.). Boston: Butterworth-Heinemann.

# CHAPTER 10

# The Self-Report Assessment of Psychopathy

# Challenges, Pitfalls, and Promises

MARTIN SELLBOM SCOTT O. LILIENFELD KATHERINE A. FOWLER KRISTEN L. McCRARY

he idea of detecting psychopaths by asking them about themselves surely strikes many readers as paradoxical. After all, why would one attempt to identify a condition marked by dishonesty by asking individuals to respond honestly to questions regarding this condition? To many, the enterprise seems pointless, doomed utterly to failure. Yet the self-report assessment of psychopathy has a lengthy, albeit checkered, history. Moreover, despite lingering controversies and serious setbacks over the past few decades, it appears to be experiencing a renaissance. Notwithstanding a host of potential pitfalls (Lilienfeld, 1994, 1998), the use of questionnaires to detect psychopathy may prove considerably more fruitful than once believed.

# **Goals of the Chapter**

In this chapter, we review the conceptual and methodological challenges confronting the assessment of psychopathy by means of self-report. We begin by examining the advantages and disadvantages of self-report measures in the assessment of psychopathy and dispelling several widespread misconceptions regarding the use of self-report measures to assess psychopathy. We next discuss long-standing problems that have plagued the questionnaire assessment of psychopathy and revisit the shortcomings of older, but still commonly administered, self-report measures that purportedly assess psychopathy. We then survey the contemporary status of self-report psychopathy measures, with an emphasis on their psychometric properties, research and clinical uses, and limitations. We conclude with a clarion call for further research on several undeservedly neglected topics concerning the self-report assessment of psychopathy.

# Advantages of Self-Report Measures in the Assessment of Psychopathy

# The Self as Observer

As the great American psychologist Gordon Allport observed, the self is in a privileged position with respect to its own mental status. For Allport (1961), the self is the "warm, central, private region of our life" (p. 110). As a consequence, selfreport measures may be of particular utility in the assessment of subjective emotional states and traits. With respect to psychopathy, the relative *absence* of such states and traits, such as guilt, empathy, fear, and feelings of intimacy toward others, is probably most diagnostically relevant. Nevertheless, those high in psychopathy may experience certain emotions, such as alienation and anger, more frequently than do those low in psychopathy.

Moreover, self-reports of personality converge with reports from other evaluators. Self-ratings of personality traits tend to concur moderately with ratings of personality traits by knowledgeable observers (r = .30-.50), with agreement typically being higher for more observable traits (e.g., Extraversion) than for less observable traits (e.g., Neuroticism) (Kendrick & Funder, 1988). Nevertheless, the substantial amount of nonshared variance between self- and observer ratings of personality introduces the possibility that each information source possesses incremental validity (Meehl, 1959; Sechrest, 1963) above and beyond the other for predicting psychologically important variables. For example, self-reports may be especially useful for detecting emotional states and enduring affective dispositions (see Grove & Tellegen, 1991), although this possibility has received surprisingly scant research attention.

# Economy

A second and more self-evident advantage of using self-report to detect psychopathy is economy. Self-report measures tend to be brief and easy to complete, and they require minimal training on the part of test administrators. In this respect, they stand in sharp contrast to the Psychopathy Checklist-Revised (PCL-R; Hare, 1991/2003), a lengthy (e.g., 90-minute) semistructured interview for psychopathy that requires access to collateral file information and extensive training in interview administration. Because the PCL-R is timeand labor-intensive, research on psychopathy in institutional settings has often been difficult to conduct (Lilienfeld, 1994). Moreover, because the PCL-R requires access to corroborative information, researchers on psychopathy in noninstitutional (e.g., college and community) settings have encountered logistical roadblocks when seeking to use this assessment approach.

#### Assessment of Response Styles

A third and often unappreciated advantage of selfreport measures is that they assess response styles systematically (Ben-Porath, 2013). In this respect, they are advantageous in comparison with interviews, virtually none of which (the PCL-R included) contain well-constructed and carefully normed response-style indicators. Certain response styles, such as positive impression management and malingering, may be particularly relevant among those high in psychopathy (Hart, Hare, & Harpur, 1992; Lilienfeld, 1994). Although such response styles may adversely affect the validity of self-reports by these individuals, questionnaires can help to detect such response styles by means of embedded validity scales (see Paulhus, 1991, for a review). Indeed, a recent study featuring the Psychopathic Personality Inventory-Revised (PPI-R; Lilienfeld & Widows, 2005), which contains validity scales for the detection of both over- and underreporting, has indicated very promising utility for self-report inventories in this regard (Anderson, Sellbom, Wygant, & Edens, 2013).

# Reliability

Finally, interrater reliability is not relevant to self-report inventories because these measures are completed by respondents and do not require "judgment calls" by interviewers or other observers. It is worth noting that many of the core features of psychopathy, such as lack of empathy and guiltlessness, require considerable clinical inference on the part of observers and therefore are unlikely to achieve anywhere near perfect interrater reliability. Because validity is limited by the square root of reliability (Meehl, 1986), the subjectivity inherent in interview-based measures will, *ceteris paribus*, constrain their validity.

# Summary

In summary, self-report measures possess several advantages in the assessment of psychopathy. They may yield useful information regarding the absence of affective states and traits, they are economical and easily administered, and they permit the systematic detection of response styles that may be especially problematic among psychopaths, namely, over- and underreporting of maladaptive personality traits and symptoms. In addition, the validity of self-report measures is not constrained by low interrater reliability. Nevertheless, as we discuss in the following section, these advantages must be considered in light of several potential disadvantages.

# Disadvantages of Self-Report Measures in the Assessment of Psychopathy

#### Dishonesty

The first disadvantage of using self-reports to detect psychopathy is obvious: Psychopathic individuals lie frequently; indeed, deceitfulness is definitional of the construct in every major theory. Moreover, the notorious dishonesty of such individuals is not limited to situations in which they can obtain tangible benefits. Instead, individuals high in psychopathy frequently lie for the sheer enjoyment of it, a phenomenon that Ekman (1985) termed "duping delight." Such individuals also lie with impunity and with minimal guilt or anxiety. As Cleckley (1941/1988) noted:

The psychopath shows a remarkable disregard for truth and is to be trusted no more in his accounts of the past than in his promises for the future of his statement of present intentions.... Typically he is at ease and unpretentious in making a serious promise or in (falsely) exculpating himself from accusations, whether grave or trivial. (p. 341)

Making matters worse, the nature of lying in psychopathy may depend largely on situational demands and therefore cannot be readily predicted without knowledge of contextual variables. That is, if psychopathic individuals are placed in a situation in which crafting a positive impression is desirable (e.g., applying for a job), they may attempt to make themselves look good, whereas if they are placed in a situation in which conveying a negative impression is desirable (e.g., being evaluated for an insanity plea), they may attempt to make themselves look bad.

Although such dissimulation on questionnaires can often be detected by response-style indicators, many of these indicators, such as the Minnesota Multiphasic Personality Inventory–2 (MMPI-2; Butcher et al., 2001) Lie (L) scale, are susceptible to the effects of coaching (Alliger, Lilienfeld, & Mitchell, 1996; Graham, 2012; Kroger & Turnbull, 1975; Vincent, Linsz, & Greene, 1966). In some cases, prevarication by highly psychopathic individuals on self-report measures reaches remarkable proportions. Hare (1985) described such a case:

To take what admittedly is an extreme example, 1 inmate (a classic psychopath by any criterion) confided (and we were able to verify) that he had his own MMPI manual, a set of scoring keys, and several books on the clinical interpretation of the MMPI. As a result, he was able to produce a given type of profile on demand, not only for himself but also for other inmates. For the latter, he operated his own consulting service, advising inmates on how they should respond to certain types of items in order to obtain the "appropriate" MMPI profile. (pp. 15–16)

Although we suspect that such cases are rare, it seems likely that psychopathic individuals who are motivated to create a specific impression on questionnaires will exhibit scant compunction about acquiring the information needed to do so.

#### Lack of Insight

Second, persons high in psychopathy often lack insight into the nature and extent of their psychological problems. In his discussion of psychopaths' "specific loss of insight," Cleckley (1941/1988) went so far as to conjecture that

in the sense of realistic evaluation, the psychopath lacks insight more consistently than some schizophrenic patients. He has absolutely no capacity to see himself as others see him. It is perhaps more accurate to say that he has no ability to know how others feel when they see him or to experience subjectively anything comparable about the situation. (p. 350)

The glaring inability-or at least failure-of many highly psychopathic individuals to perceive themselves as others perceive them may limit the usefulness of certain self-report items, especially those that require at least a modicum of accurate knowledge regarding the impact of their behavior on others. As a consequence, observers may be superior to psychopathic individuals when reporting on certain overt behaviors and their consequences. Grove and Tellegen (1991) argued that observer reports may be especially useful for detecting "blind spots" among individuals with egosyntonic personality disorders, that is, personality disorders that are consistent with the self-concept. Psychopathy, which is marked by a striking absence of awareness into the impact of one's actions on others, is in many respects the quintessential ego-syntonic personality disorder.

In contrast, recent research has demonstrated that the impact of potential lack of insight associated with self-report-based assessment of psychopathy might be minimal. Miller, Jones, and Lynam (2011) conducted mean-level and correlation analyses of self- and informant reports of psychopathy and five-factor model (FFM) traits in a community sample recruited partly for psychopathic traits. These authors found very strong convergence among self- and informant report psychopathy scores and few mean differences in psychopathy scores between the two. The same pattern emerged for personality traits more broadly, providing tentative evidence that lack of insight is unlikely to meaningfully affect scores on psychopathy self-reports (but see Fowler & Lilienfeld, 2007). This conclusion may be limited, however, to self-report measures that do not contain items requiring metacognitive judgments regarding the implications of psychopathy for oneself or others (e.g., "How much is your behavior a problem for your friends?"), a possibility that warrants investigation in future research.

One can conceptualize the potential disadvantages and advantages of self-report measures of psychopathy and related conditions by means of the Johari window (named, curiously enough, after the first names of its developers Joseph Luft and Harry Ingham), which schematically represents the four major "regions" of personality as perceived by both self and observers (Luft, 1969). As shown in Figure 10.1, this window consists of four cells: the region of personality known to both self and others (the "open" quadrant), the region of personality known to the self but not others (the "hidden" quadrant), the region of personality known to others but not the self (the "blind" quadrant), and, finally and perhaps most interesting, the region of personality known to neither the self nor to others (the "unknown" quadrant). Observer reports are potentially of particular utility in assessing the blind quadrant, where others can report on attributes that psychopathic individuals are either unable or unwilling to report.

	known to self	not known to self
known to others	OPEN	BLIND
not known to others	HIDDEN	UNKNOWN

**FIGURE 10.1.** The Johari window conceptualizes personality as a multilayered construct, with quadrants representing combinations of self- and other-awareness (Luft, 1969).

#### Semantic Aphasia

Third, it may be inherently problematic to ask individuals who have never experienced an emotion (or who have experienced only weak variants of this emotion) to report on its absence. As George Kelly (1955) observed, a full understanding of a dimension requires an appreciation of both of its poles. For example, the experience of "cold" has no subjective meaning unless one has experienced heat. Similarly, asking psychopaths to report on the absence of guilt may be fruitless given that they have had scant experience with its presence.

Taking this argument a step further, Cleckley (1941/1988; see also Hare, 1993) speculated that the core pathology in psychopathy is a deficit in affective experience and understanding, analogous to the brain syndrome of semantic aphasia: "[J]ust as meaning and the adequate sense of things as a whole are lost with semantic aphasia in the circumscribed field of speech although the technical mimicry of language remains intact, so in most psychopaths the purposiveness and the significance of all life-striving and of all subjective experience are affected without obvious damage to the outer appearance or superficial reactions of the personality" (Cleckley, 1941/1988, p. 383). In this sense, Cleckley viewed psychopathy as akin to color-blindness. Just as color-blind individuals often learn to refer to apples as red and leaves as green because they are aware of the verbal labels attached to natural objects, individuals high on psychopathy may erroneously learn to label certain emotions as "guilt" or "fear" even though they have never experienced them. For example, they may learn to refer to "guilt" when they experience negative affect after committing an antisocial act and receiving punishment for it, even though they are actually experiencing regret (displeasure upon getting caught) rather than remorse. From this perspective, psychopaths' reporting of many emotions may be inaccurate but not insincere.

#### Saturation with Demoralization

Fourth, many self-report measures of psychopathology are heavily saturated with demoralization, a pervasive higher-order affect dimension reflecting a propensity to experience negative emotions of many kinds, including unhappiness, distress, anxiety, irritability, hostility, and mistrust. Demoralization courses through many psychiatric conditions, including mood disorders, anxiety disorders, psychotic disorders, eating disorders, and somatoform disorders (Tellegen et al., 2003; Watson & Clark, 1984); thus, one of the great challenges in constructing self-report measures of psychopathology is to avoid saturation with demoralization or dimensions related to it, including negative emotionality (Finney, 1985; Tellegen, 1985; Tellegen et al., 2003). Though one might expect measures of psychopathy to be largely free of demoralization, many such measures, including the MMPI-2 Psychopathic Deviate (Pd) scale, are substantially contaminated by this nonspecific distress construct (Sellbom, Ben-Porath, McNulty, Arbisi, & Graham, 2006; Sellbom, Ben-Porath, & Stafford, 2007; see also Lilienfeld, 1994). This saturation is especially true of self-report measures that assess the antisocial lifestyle and impulsive behaviors associated with psychopathy, many of which may (1) spring in part from demoralization and (2) contribute further to demoralization by creating life stressors and resentment.

#### Summary

In summary, there are several reasons to be skeptical regarding the use of self-report measures in the assessment of psychopathy. Psychopathic individuals lie frequently and are likely to lack insight into the nature and extent of their psychological problems. Moreover, because they have not experienced certain affective states (e.g., guilt, empathy), they may be unable to report accurately on their absence. In addition, several self-report measures designed to assess psychopathy are heavily saturated with demoralization, reducing their discriminant validity for distinguishing psychopathy from other conditions marked by antisocial behavior.

The problems highlighted in this section have led some authors to conclude that self-report measures may be inherently ill-suited for assessing psychopathy. For example, Edens, Hart, Johnson, Johnson, and Olver (2000) contended that the use of questionnaires to detect psychopathy may be an example of a "method-mode mismatch" (see Haynes, Richard, & Kubany, 1995)-entailing the use of a method (in this case, self-report) that is not optimal for the assessment of a construct (in this case, psychopathy). As we argue later in the chapter, method-mode mismatch would have been a viable hypothesis for the less than stellar psychometric showing of some self-report measures of psychopathy, but data for newer promising measures appear largely to rule it out.

# Misconceptions and Misunderstandings Regarding the Self-Report Assessment of Psychopathy

Although several of the disadvantages of self-report psychopathy measures raise important questions regarding their validity, we would be remiss not to address three misconceptions that have found their way into the psychopathy literature. These misconceptions have led to misunderstandings regarding the potential uses and misuses of questionnaires for detecting psychopathy and have led some authors to prematurely discount the potential value of self-reports in the assessment of this condition.

# The Requirement of Veridical Responding

The first misconception regarding self-report measures is that their validity hinges on the assumption of veridical responding (Lilienfeld, 1994). This misconception has led some to guestion whether self-reports can be useful in the assessment of psychopathy given that psychopaths' dishonesty and lack of insight presumably lead to inaccurate responding. However, as Meehl (1945) noted, the responses to self-report items can be conceptualized as interesting samples of verbal behavior in their own right. These responses may or may not be factually accurate, but they can offer diagnostically helpful information regarding respondents' apperceptions of themselves and the world. For example, consider the item, "I often get blamed for things that aren't my fault," which appears on the PPI (Lilienfeld & Andrews, 1996), a self-report measure of psychopathy that we discuss later. An affirmative response to this item is a valid indicator of psychopathy, even though it is unlikely to be factually accurate. After all, most individuals high in psychopathy are probably not blamed nearly enough for things that go wrong in their lives, and those things that do go wrong are typically their fault! Nevertheless, this item provides useful information regarding the well-known propensity of psychopathic individuals to externalize blame (Hare, 1991/2003) and to perceive others as malevolent (Millon, 1981). Similarly, the item "I can read people like a book," which appears on the Self-Report Psychopathy Scale-II (see Hare, 1985), is a valid indicator of the grandiosity associated with psychopathy, although it is not at all clear that psychopathic individuals' interpersonal perception skills are better than those of nonpsychopathic individuals. In fact, the admittedly limited research literature on this question suggests that they are probably not (e.g., Morgan, 2000; Stevens, Charman, & Blair, 2001).

Published research further suggests that this deficit is unlikely to constitute a significant problem with respect to predictive validity of self-report assessment. Edens, Poythress, Lilienfeld, and Patrick (2008) found that self-reported PPI scores actually outperformed clinician-rated PCL-R scores in predicting institutional misconduct. Although their sample was quite small (N = 46), these findings certainly do not indicate an inherent disadvantage of self-report assessment of psychopathy with respect to predictive validity of maladaptive behavior. Moreover, in a slightly larger community sample, Jones and Miller (2012) found that self- and informant-reported data on psychopathy were about equally predictive of selfand informant reports of externalizing behaviors, and neither added much incremental validity bevond the other. In cases where differences were observed, the self-report measures performed better. Taken together, there is no evidence that veridical responding or lack of insight impacts the validity of self-report or that this method is necessarily less valid than other ratings with respect to predicting maladaptive behaviors.

#### Propensity toward Positive Impression Management

A second misconception is that psychopathic individuals consistently engage in positive impression management on self-report measures. In fact, selfreport measures of psychopathy tend to be slightly or moderately negatively correlated with indices of social desirability and positive impression management (e.g., Hare, 1982; Lilienfeld & Andrews, 1996; Marion et al., 2013; see Ray et al., 2013, for a meta-analysis). Though perhaps puzzling, this finding is understandable given that psychopathic individuals' behaviors and personality traits tend to be socially undesirable. Moreover, one might conjecture that those high in psychopathy possess a different conception of what is socially undesirable compared with the average person; for example, they may perceive as "normal" antisocial behaviors that others perceive as undesirable. This negative correlation suggests that psychopathic individuals often report accurately on the presence of socially devalued characteristics such as antisocial behaviors, recklessness, hostility, and poor impulse control (Lilienfeld, 1994). It should also be borne in mind that response style measures, such as self-report "validity" scales, are not entirely independent of trait variance (Paulhus, 1991; Piedmont, McCrae, Reimann, & Angleitner, 2000). As a consequence, extreme (either high or low) scores on these scales are probably heterogeneous in origin, as they reflect genuine variance relevant to personality and psychopathology on the part of most respondents, in addition to conscious dissimulation on the part of others.

# Aptitude for Response Bias

A third misconception is that individuals high in psychopathy are particularly skilled at manipulating their responses to self-report measures; thus, their test scores are even more untrustworthy than those of nonpsychopathic dissimulators. Although several studies have indeed found that offenders who score high on the PCL-R are more likely to engage in response bias (Kucharski, Duncan, Egan, & Falkenbach, 2006; Marion et al., 2013; Poythress, Edens, & Watkins, 2001; Rogers et al., 2002; see Ray et al., 2013, for a meta-analysis), there is no evidence to indicate that they are better at it and there is at least some preliminary evidence against it (Book, Holden, Starzyk, Wasylkiw, & Edwards, 2006; Edens, Buffington, & Tomicic, 2000a; MacNeil & Holden, 2006; Marion et al., 2013; Poythress, Edens, & Watkins, 2002). In the most recent study on this topic, Marion and colleagues (2013) asked 465 undergraduate students to respond in an overreporting, underreporting, or honest manner on the MMPI-2 Restructured Form (MMPI-2-RF; Ben-Porath & Tellegen, 2008). They examined whether psychopathy (operationalized using multiple self-report inventories) moderated the utility of the well-established MMPI-2-RF validity scales in differentiating between over- and underreporters and honest students; no such effect was found, and in fact, those scoring high on the meanness (i.e., callous-unemotional, exploitative-aggressive) domain of psychopathy were worse at avoiding detection by scales designed to identify underreporting than those who scored low on this domain. In a second study, Marion and colleagues found that PCL-R total scores did not moderate the MMPI-2-RF validity scales' utility in differentiating between overreporting and honest reporting offenders (identified using the Structured Interview for Reported Symptoms; Rogers, Bagby, & Dickens, 1992). Therefore, although those high in psychopathy may be more inclined than those low in this construct to overreport on psychological tests when it is in their best interest (Rogers et al., 2002), there is no evidence that they are especially adept at doing so.

# Long-Standing Empirical Problems in the Self-Report Assessment of Psychopathy

Until perhaps the last decade or so, the self-report assessment of psychopathy was regarded by many as a deeply troubled endeavor (e.g., Hare, 1985; Hart et al., 1992), perhaps even a hopeless morass. In particular, this field was bedeviled by three major empirical problems. As we will see, these problems persist to some degree even to the present day, although there has been promising progress toward their resolution.

# Low Correlations among Psychopathy Questionnaires

First, the results of several early studies indicated that questionnaires designed to assess psychopathy were weakly or at best negligibly intercorrelated. Such findings suggested that these measures assess only slightly overlapping aspects of the same construct, and that putatively comparable measures of psychopathy are by no means interchangeable. For example, in a study of 397 male adult prison inmates, Hundleby and Ross (1977) administered the Activity Preference Questionnaire (Lykken, Tellegen, & Katzenmeyer, 1973), a measure of fearfulness found previously to distinguish psychopathic individuals from low-psychopathy controls (Lykken, 1957; see also Lilienfeld & Andrews, 1996), together with the Eysenck Personality Inventory (Eysenck & Eysenck, 1964), the MMPI (Hathaway & McKinley, 1940), the Sensation-Seeking Scale (SSS; Zuckerman, Kolin, Price, & Zoob, 1964), and the Personal Opinion Study (Quay & Parsons, 1971). They found low intercorrelations among these differing self-report measures. Furthermore, they found that no general factor corresponding to psychopathy emerged in lower-order factor analyses. Nevertheless, other work has demonstrated that several of the questionnaires they administered, such as Eysenck's Extraversion scale and most of the MMPI scales, are only peripherally relevant to psychopathy. Moreover, Hundleby and Ross (1977) did not conduct a higher-order factor analysis to determine whether a higher-order psychopathy dimension would emerge from their lower-order factors. Given that Cleckley (1941/1988), Hare (1991/2003), and other authors have argued that since psychopathy comprises a variety of personality traits, there is no reason to expect a single psychopathy factor to emerge at the lower-order level.

More compelling evidence comes from a study by Hare (1985), who administered a number of selfreport measures, including the MMPI Psychopathic Deviate (Pd) scale and Hypomania (Ma) scales, Gough's (1960) California Psychological Inventory (CPI) Socialization (So) scale (see also Kosson, Steuerwald, Newman, & Widom, 1994), which is often scored in reverse as a measure of psychopathy, and the Self-Report Psychopathy (SRP) scale, to 274 male adult prison inmates. In addition, trained raters completed a number of clinical-behavioral assessments, including the PCL and an index of symptoms of antisocial personality disorder (ASPD) as defined in the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III; American Psychiatric Association [APA], 1980). Like Hundleby and Ross (1977), Hare found low or at best moderate correlations among the self-report measures, which ranged in magnitude from .14 to .53. Moreover, some measures previously viewed as virtually interchangeable shared little variance; for example, the MMPI Pd scale and Socialization (So) scale were only correlated at r = -.34.

Widom and Newman (1985) reported somewhat more promising results. They recruited 40 participants from the community using a newspaper advertisement that featured many of Cleckley's (1941/1988) characteristics of psychopathy framed in socially desirable language. For example, part of the advertisement requested "adventurous, carefree people who've led exciting impulsive lives" (p. 58). Widom and Newman administered a variety of self-report (including the MMPI Pd scale and Gough's [1960] So scale) and interview (including Robins's [1966] criteria for sociopathy and the Research Diagnostic Criteria [RDC] for ASPD) measures relevant to psychopathy and antisocial behavior. The absolute values of these correlations were higher than those reported by Hare (1985), and ranged from r = .43 to .89. Moreover, in contrast to Hare, the MMPI Pd scale and So scale were highly correlated (r = -.78). The reason for the discrepancy across studies is unclear; it does not appear attributable to differences in score variance because the variances of the Pd and So scales in Hare's study were actually larger than those in Widom and Newman's study. Nevertheless, Widom and Newman found that the correlations between the MMPI Pd scale and other measures were below r = .50.

#### The Role of Method Covariance

Although the correlations among self-report measures of psychopathy are often low or modest, even these correlations may partly reflect method variance arising from the shared use of a self-report format. Relevant to this, in the study mentioned in the previous section, Hare (1985) conducted a principal components analysis of the self-report and clinical-behavioral measures administered to prison inmates. This analysis yielded a twocomponent solution that accounted for 71.5% of the variance among measures, but these two components appeared to reflect method variance rather than content variance. Specifically, the first component was marked by high loadings on the clinical-behavioral measures, whereas the second component was marked by high loadings on the self-report measures. The content of the scales appeared to exert little impact on the pattern of intercorrelations. For example, even though the PCL-R scores and DSM-III criteria for ASPD ostensibly manifest as different constructs (psychopathy vs. ASPD, respectively; see Hare, 1991/2003; Lilienfeld, 1994), they loaded more highly with each other than with self-report measures ostensibly assessing the same construct.

Widom and Newman (1985) reported roughly comparable results in the study described in the previous section. Specifically, they found that the absolute value of the correlation between the MMPI Pd scale and CPI So scale was high (as noted earlier, r = -.78), as was the correlation between Robins's (1966) criteria for sociopathy and the RDC criteria for ASPD (r = .89). In contrast, the absolute values of correlations between these two sets of measures (questionnaires and interviews, respectively) were lower, ranging from r =.43 to .57. Although Widom and Newman did not test the differences in correlations against each other, we performed such tests and found that, with the exception of the correlation between the Robins criteria and the So scale (absolute r = .67), the cross-method correlations were significantly (p < .05) lower than the within-method correlations.

Most recently, Blonigen and colleagues (2010) examined the association between PCL-R (clinician-rated) and PPI (self-rated) psychopathy scores and externalizing psychopathology (both clinician-rated and self-rated) in a large correctional sample. Analyses demonstrated that psychopathy scores (total and social deviance factor) were significantly associated with externalizing problems, with the magnitude of associations higher when the two were assessed in the same (vs. different) measurement modality. However, in a measurement model that controlled statistically for shared method variance, the magnitude of the two psychopathy measures' associations with externalizing features were almost identical (associations for PPI Factor 1 and PPI Factor 2 with self-reported externalizing were .15 and .69, respectively; associations for PCL-R Factor 1 and Factor 2 with interview-based externalizing were .11 and .65, respectively).

Taken together, these findings suggest that method covariance contributes substantially to the gap in correlations for measures within versus across domains. However, one cannot rule out the rival hypothesis that measurement mode (i.e., selfreport vs. interview) was confounded with substantive content (e.g., item coverage of the core affective and interpersonal features of psychopathy vs. the antisocial and impulsive lifestyle sometimes associated with psychopathy).

#### Nonspecific Measures of Behavioral Deviance

Another shortcoming of many self-report psychopathy measures is that they appear primarily to be nonspecific measures of behavioral deviance, that is, global antisocial and criminal behavior, rather than measures of the core affective and interpersonal features of psychopathy, such as guiltlessness, callousness, lovelessness, and egocentricity. In one of the first studies to address this issue, Harpur, Hare, and Hakstian (1989) examined the correlations of the two factors of the original PCL (Hare, 1980) with several self-report indices relevant to psychopathy, including the MMPI Pd and Ma scales, the So scale, the Eysenck Personality Questionnaire Psychoticism scale (Eysenck & Eysenck, 1975), the SSS, and the SRP. The correlations of these questionnaires with PCL Factor 2, which assesses an antisocial and impulsive lifestyle, were moderately high and were generally in the r = .30– .50 range. In contrast, the correlations of these questionnaires with PCL Factor 1, which assesses the core affective and interpersonal features of psychopathy, were negligible to low, and generally in the r = .05 - .15 range. Perhaps most surprisingly, two of the most frequently administered self-report measures of psychopathy (Hare & Cox, 1978), the MMPI Pd scale and the So scale, correlated with PCL Factor 1 at only r = .05 and -.06, respectively (this latter correlation, albeit minimal, is in the expected direction, as lower So scores are ostensibly related to higher psychopathy). Of all major self-report measures examined by Harpur and colleagues (1989), the two that fared "best" were the SRP and a sum-composite of the MMPI Pd and Ma scales, each of which correlated only r = .18with PCL Factor 1. Results consistent with these were reported by (1) Gynther, Altman, and Warbin (1973), who found that psychiatric inpatients with the MMPI Pd-Ma code type reported significantly more guilt feelings than other inpatients, perhaps reflecting the heavy saturation of this code type with demoralization, and (2) Hare and Cox (1978), who reported that the MMPI Pd-Ma code type did not distinguish between inmates with high and low global ratings of psychopathy.

Harpur and colleagues' (1989) findings suggest that several widely used self-report measures of psychopathy, including the MMPI Pd scale, are largely unrelated to the core personality features of this condition (see also Hawk & Peterson, 1973). More recently, Sellbom and colleagues (2007) examined correlations between scores on the interview-based PCL: Screening Version (PCL:SV; Hart, Cox, & Hare, 1995) and MMPI-2 scales that index antisociality. Consistent with the previous studies just described, the Pd scale of the MMPI-2 correlated .09 and .45 with PCL:SV Parts 1 and 2, respectively. Other MMPI-2 antisociality scales (Antisocial Behavior [RC4], Antisocial Practices [ASP], and Disconstraint [DISC]) showed more promise in their correlations with PCL:SV Part 1 (r's = .29–.36), although they were substantially more strongly associated with Part 2 scores (r's = .41–.62; r's with PCL:SV total scores = .39-.50). Consistent with results from Harpur and colleagues, the implication is that these MMPI-2 scales appear to be indicators of broad-based externalizing tendencies, which do not distinguish psychopathy from a variety of other conditions often associated with antisocial and criminal behavior (Krueger et al., 2002; Krueger, Markon, Patrick, Benning, & Kramer, 2007; see also Lykken, 1995, for a discussion).

Several investigators have reported similar results for other self-report measures that ostensibly assess psychopathy or closely allied constructs. In a sample of 119 male prison inmates, Hart, Forth, and Hare (1991) found that Scales 6A (Antisocial) and 6B (Aggressive/Sadistic) of the Millon Clinical Multiaxial Inventory–II (MCMI-II; Millon, 1987) were more highly correlated with Factor 2 of the PCL-R (r's = .51 and .34, respectively) than with Factor 1 (r's = .24 and .28). With the exception of the correlation between Scale 6A and Factor 1, all of these correlations were statistically significant. Hart and colleagues did not report partial correlations evaluating the associations of Scales 6A and 6B with each PCL-R factor when controlling for the influence of the other factor. Nevertheless, their findings indicate that the two MCMI-II scales ostensibly most relevant to psychopathy are only weakly related to the core interpersonal and affective features of this condition.

In a sample of 46 forensic psychiatric inpatients, Edens and colleagues (2000) found that the Antisocial (ANT) scale of the Personality Assessment Inventory (PAI; Morey, 2007) correlated moderately (r = .44) with Factor 1 of the PCL:SV, and somewhat more highly with Factor 2 (r = .56). However, when covariance between the two factors was controlled for, the ANT scale showed minimal association with Factor 1 (r = .07), while remaining significantly correlated with Factor 2 (r = .39). These findings suggest that Factor 1 traits are moderately related to ANT scale scores, but mainly as a function of their overlap with Factor 2 tendencies. These same authors found an even greater difference in relationships for the two factors in a separate sample of 55 sex offenders: Within this sample, the PAI ANT scale correlated moderately with PCL-R Factor 2 (r = .53) at the zero-order level, but negligibly with Factor 1. When overlap between the two factors was controlled for, the association for Factor 2 remained virtually identical (r = .54) but the correlation for Factor 1 became negative (r = -.17).

#### Summary

The self-report assessment of psychopathy has been plagued by three enduring empirical problems: (1) Questionnaires designed to assess psychopathy and ostensibly related constructs frequently exhibit low or modest intercorrelations, indicating that they are not interchangeable measures of the same construct; (2) correlations among psychopathy questionnaires may be inflated by shared method variance arising from the use of a self-report format, although the extent to which this format is confounded with substantive content (e.g., relative emphasis on the core affective and interpersonal features of psychopathy vs. antisocial behaviors) is unclear; and (3) self-report indices of psychopathy that have been used commonly up until recently, including the MMPI Pd scale, CPI So scale, MC- MI-II scale 6A, and PAI ANT scale, are related appreciably more to Factor 2 than Factor 1 of the PCL and its variants, suggesting that these scales index nonspecific behavioral deviance rather than core interpersonal and affective features of psychopathy. The last of these problems is likely attributable to the fact that psychopathy is not a unitary construct and is therefore unlikely to be fully captured by only a single scale from an omnibus self-report inventory. As Sellbom and colleagues (2007, 2012, 2016) have pointed out in their work with the MMPI-2/MMPI-2-RF, a combination of trait scales (including scales indexing fearfulness, anxiety, social potency, gregariousness, and disaffiliativeness) is typically necessary to approximate the full scope of the psychopathy construct (Phillips, Sellbom, Ben-Porath, & Patrick, 2014; Sellbom, Ben-Porath, Lilienfeld, Patrick, & Graham, 2005; Sellbom et al., 2012). Indeed, this strategy has been better implemented in newer, promising self-report measures of this construct, which we describe next.

# Contemporary Self-Report Measures of Psychopathy

The shortcomings of extant psychopathy questionnaires have led several scholars to develop new self-report measures in the hopes of remedying these problems. In this section, we review the psychometric status, strengths, and weaknesses of five such measures: the Levenson Self-Report Psychopathy Scale (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995); the SRP (see Hare, 1985) and its revisions, the SRP-II and SRP-4 (Paulhus, Neumann, & Hare, 2017); the PPI/PPI-R (Lilienfeld, 1990; Lilienfeld & Widows, 2005); the Triarchic Psychopathy Measure (TriPM; Patrick, 2010b); and the Elemental Psychopathy Assessment (EPA; Lynam et al., 2011). We focus on these particular measures because (1) they were designed at least in part to remedy the shortcomings of previously developed psychopathy measures (e.g., the MMPI Pd scale, CPI So scale); (2) they were formulated to serve as measures of psychopathy per se rather than generalized behavioral deviance (e.g., the MMPI-2 Antisocial Practices scale; Butcher, Graham, Williams, & Ben-Porath, 1990; Lilienfeld, 1996); and (3) they have each been examined in several published studies.

We have opted not to review self-report measures of psychopathy in children and adolescents given the coverage of these measures elsewhere (Salekin, Andershed, & Clark, Chapter 20, this volume). We also opted not to cover self-report measures of adult psychopathy and related constructs that are inadequately researched, such as the MMPI-based Sociopathy scale (Spielberger, Kling, & O'Hagan, 1978), the Psychopathic State Inventory (Haertzen, Martin, Ross, & Niedert, 1980), the Social Psychopathy Scale (Edelmann & Vivian, 1988; Smith, 1985), the Antisocial Personality Questionnaire (Blackburn & Fawcett, 1999), or various measures of the so-called "dark triad" (e.g., Jonason & Webster, 2010)—as these measures tend to be restricted in content coverage relative to those described below.

# Levenson Self-Report Psychopathy Scale

#### Construction

The LSRP scale was developed by Levenson and colleagues (1995) to detect self-reported psychopathic features in noninstitutional samples. It consists of 26 items on a 4-point Likert-type format that forms two scales, Primary and Secondary, which were rationally constructed to serve as counterparts to PCL-R Factors 1 and 2, respectively. Consistent with this objective, Levenson and colleagues' initial exploratory factor analyses revealed two thematic factors that appeared to parallel those of the PCL-R. A representative item from the Primary Psychopathy Scale is "Looking out for myself is my top priority," whereas a representative item from the Secondary Psychopathy Scale is "I am often bored."

Following from the classic writings of Karpman (1948), Levenson and colleagues (1995) hypothesized that PCL-R Factor 1 is primarily indicative of "primary" (Cleckley, 1941/1988) psychopathy, whereas PCL-R Factor 2 is primarily indicative of "secondary" psychopathy. The latter is presumed to reflect a heterogeneous mélange of conditions (Lykken, 1995) entailing high neuroticism and high impulsivity, but lacking the salient emotional and interpersonal detachment characteristic of true (primary) psychopathy. From this perspective, Levenson and colleagues reasoned, the LSRP Primary and Secondary Psychopathy scales can be differentiated on the basis of trait anxiety, with high scorers on the former scale being low in trait anxiety and high scorers on the latter being high in trait anxiety.

# Factor Structure

Research on the LSRP factor structure has been mixed. Lynam, Whiteside, and Jones (1999) found

support for the original two-factor structure in a large mixed-gender college student sample, but this factor solution required specification of 17 correlated residual variances to achieve acceptable model fit—raising concerns about its stability/replicability. Addressing these concerns somewhat, Brinkley, Schmitt, Smith, and Newman (2001) replicated Lynam and colleagues' factor structure in a large male correctional sample. However, a subsequent study by the same research group (Brinkley, Diamond, Magaletta, & Heigel, 2008) failed to replicate this two-factor structure in a large female correctional sample, instead finding evidence for three factors reflecting Egocentricity, Callousness, and Antisociality. In a subsequent study, Sellbom (2011) contrasted these alternative models in male and female university samples

(Brinkley, Diamond, Magaletta, & Heigel, 2008) failed to replicate this two-factor structure in a large female correctional sample, instead finding evidence for three factors reflecting Egocentricity, Callousness, and Antisociality. In a subsequent study, Sellbom (2011) contrasted these alternative models in male and female university samples, as well as a male correctional sample, and found the best fit for the Brinkley and colleagues (2008) three-factor model. Further support for the superior fit of this three-factor model was provided by Christian and Sellbom (2016) in two large community samples, Shou, Sellbom, and Han (2016) in a large Chinese university sample, Somma and colleagues (2014) in a large Italian community sample, and Salekin, Chen, Sellbom, Lester, and MacDougall (2014) in a large university sample although these latter authors found some evidence that the original two-factor model may exhibit better convergent and discriminant validity than the three-factor model.

# Psychometric Properties of the LSRP Primary and Secondary Scales

In a sample of 487 undergraduates, Levenson and colleagues (1995) reported that the LSRP Primary scale exhibited adequate internal consistency (Cronbach's alpha = .82), although the internal consistency of the Secondary scale was marginal (alpha = .63). Moreover, these two scales were moderately correlated (r = .40). In another large undergraduate sample (N = 1,154), Lynam and colleagues (1999) reported alphas of .84 and .68, for the Primary and Secondary scales, respectively, which correlated .43 with one another. The interpretation of the correlation between the two LSRP scales is unclear. On the one hand, it may support the convergent validity of the Primary and Secondary scales if one assumes that each scale is a lower-order marker of a higher-order psychopathy dimension. On the other hand, this intercorrelation may call into question the discriminant validity of these scales given that Karpman (1948) regarded primary and secondary psychopathy as etiologically distinct, perhaps even negatively correlated, conditions. Levenson and colleagues found that males scored significantly higher than females on both scales, although only the difference for Primary Psychopathy was marked in magnitude. This difference is consistent with previous findings that males tend to be higher in psychopathy than females (Lykken, 1995).

Table 10.1 shows the associations between LSRP Primary and Secondary scales and extratest psychopathy, personality, behavioral, and laboratory task criteria from a range of studies available in the literature. By and large, these scales show associations with such criteria in ways that would be conceptually expected, with some notable exceptions. Associations between the Primary scale and other affective-interpersonal psychopathy traits are smaller relative to this LSRP subscale's association with behavioral psychopathy traits. Moreover, the absence of a substantial negative correlation between the Primary scale and trait anxiety calls into question this scale's construct validity, as Levenson and colleagues (1995) predicted that primary psychopaths should be low in trait anxiety. Finally, trait correlates of the Secondary scale indicate that it is highly saturated with emotional distress.

# Psychometric Properties of the LSRP Three-Factor Model Scales

The three-factor LSRP model has received considerably less attention given its relative recency. Reported internal consistencies (alphas) have ranged from .82 to .84 for the Egocentricity scale, .61 to .74 for the Callous scale, and .62 to .72 for the Antisocial scale (Anderson et al., 2013; Brinkley et al., 2008; Few, Miller, & Lynam, 2013; Sellbom, 2011; Sellbom & Phillips, 2013). In terms of criterion-related validity, Brinkley and colleagues (2008) reported results from regression analyses using subscales of the Personality Assessment Inventory (PAI; Morey, 2007) and the Buss-Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992) as predictors of scores on each LSRP scale in a female offender sample. LSRP Egocentricity was primarily predicted by BPAQ Hostility and the three subscales of the PAI Antisocial Personality scale (Egocentricity, Stimulation Seeking, Antisocial Behavior). The LSRP Callous subscale was preferentially associated with PAI Antisocial-Egocentricity, PAI Dominance, and PAI Paranoid scale scores. Finally, the LSRP Antisocial scale showed associations with all BPAQ aggression scales, as well as with the Antisocial Behavior,

Criteria	Primary	Secondary	Studies, sample type, and size
Psychopathy measures			
PCL Total	M+/M+	M+/S+	Brinkley et al. (2001)—AO—270 Wm, 279 AAm
PCL Factor 1	M+/M+ S+	S+/ns ns	Brinkley et al. (2001)—AO—270 Wm, 279 Aam Poythress et al. (2010)—AO—1,413m, 299f
PCL Factor 2	M+/M+	M+/M+ M+	Brinkley et al. (2001)—AO—270 Wm, 279 Aam Poythress et al. (2010)—AO—1,413m, 299f
PPI Total	Ľ+	M+	Wilson et al. (2011)—US—66m, 50f
PPI Fearless Dominance (and subscales)	S+ S+ S+ M+	S– ns/S+ ns ns	Poythress et al. (2010)—AO—1,413m, 299f Seibert et al. (2011)—US—76m, 54f Wilson et al. (2011)—US—66m, 50f Witt et al. (2009b)—US—70m, 234f
PPI Self-Centered Impulsivity (and subscales)	L+ S+/L+ L+ L+	L+ M+/L+ L+ L+	Poythress et al. (2010)—AO—1,413m, 299f Seibert et al. (2011)—US—76m, 54f Wilson et al. (2011)—US—66m, 50f Witt et al. (2009b)—US—70m, 234f
PPI Coldheartedness	L+ L+ L+	M+ S+ S+	Seibert et al. (2011)—US—76m, 54f Wilson et al. (2011)—US—66m, 50f Witt et al. (2009b)—US—70m, 234f
SRP-4 Interpersonal Manipulation	L+ L+	M+ M+	Seibert et al. (2011)—US—76m, 54f Wilson et al. (2011)—US—66m, 50f
SRP-4 Callous Affect	L+ L+	M+ M+	Seibert et al. (2011)—US—76m, 54f Wilson et al. (2011)—US—66m, 50f
SRP-4 Erratic Lifestyle	M+ M+	L+ L+	Seibert et al. (2011)—US—76m, 54f Wilson et al. (2011)—US—66m, 50f
SRP-4 Criminal Tendencies	M+ M+	M+ M+	Seibert et al. (2011)—US—76m, 54f Wilson et al. (2011)—US—66m, 50f
YPI Grandiose–Manipulative	L+	L+	Campbell et al. (2009)—US—56m, 161f
YPI Callous subscales	L+	M+	Campbell et al. (2009)—US—56m, 161f
YPI Impulsive–Irresponsible	M+	L+	Campbell et al. (2009)—US—56m, 161f
Personality measures			
Neuroticism/Negative Emotionality/ Trait Anxiety	Ns ns ns Ns ns	M+ S+ M+ S+	Levenson et al. (1995)—US—135m, 346f McHoskey et al. (1998)—Study 1—US—28m, 71f Lynam et al. (1999)—Study 1—US—655m, 1,191f Seibert et al. (2011)—US—76m, 54f Salekin et al. (2014)—US—378m, 869f
Agreeableness	M– M– L– L–	M– M– M–	McHoskey et al. (1998)—Study 2—34m, 91f Lynam et al. (1999)—Study 1—US—655m, 1,191f Seibert et al. (2011)—US—76m, 54f Salekin et al. (2014)—US—378m, 869f (continued)

# TABLE 10.1. Effect Size Estimates for LSRP Primary and Secondary Scales with Extratest Criterion Variables

Criteria	Primary	Secondary	Studies, sample type, and size
Agreeableness	M– M– L– L–	M– M– M– M–	McHoskey et al. (1998)—Study 2—34m, 91f Lynam et al. (1999)—Study 1—US—655m, 1,191f Seibert et al. (2011)—US—76m, 54f Salekin et al. (2014)—US—378m, 869f
Conscientiousness	S– S– S–	M– L– L–	Lynam et al. (1999)—Study 1—US—655m, 1,191f Seibert et al. (2011)—US—76m, 54f Salekin et al. (2014)—US—378m, 869f
Openness	Ns S– S–	Ns ns Ns	Lynam et al. (1999)—Study 1—US—655m, 1,191f Seibert et al. (2011)—US—76m, 54f Salekin et al. (2014)—US—378m, 869f
Machiavellianism	L+	M+	McHoskey et al. (1998)—Study 2—US—34m, 91f
Impulsivity/sensation seeking	M+ ns	S+ M+	Levenson et al. (1995)—US—135m, 346f McHoskey et al. (1998)—Study 1—US—28m, 71f
Aggression/Hostility	ns	S+	McHoskey et al. (1998)—Study 1—US—28m, 71f
Thrill–Adventure Seeking/Harm Avoidance/Behavioral Inhibition	ns/S– M–	Ns ns	Levenson et al. (1995)—US—135m, 346f McHoskey et al. (1998)—Study 1—US—28m, 71f
Emotional intelligence (conceptually relevant scales)	M-/L-	M-/L-	Salekin et al. (2014)—US—378m, 869f
Self-Conscious Affect (Guilt, Detachment, Blame Externalizing)	L–, M+, M+	M–, S+, S+	Salekin et al. (2014)—US—378m, 869f
Behavioral/history variables			
Antisociality/criminality	M+ M+ S+ S+/M+	M+ M+ S+ S+/S+	Levenson et al. (1995)—US—135m, 346f McHoskey et al. (1998)—Study 2—US—34m, 91f Lynam et al. (1999)—Study 1—US—655m, 1,191f Brinkley et al. (2001)—AO—270 Wm, 279 AAm
Alcohol abuse	S+	S+	Lynam et al. (1999)—Study 1—US—655m, 1,191f
Drug abuse	S+	S+	Lynam et al. (1999)—Study 1—US—655m, 1,191f
Laboratory tasks			
Go/no-go commission errors	S+	S+	Lynam et al. (1999)—Study 2—US—70m
Passive avoidance learning	S– Sig-NR	S– Sig-NR	Lynam et al. (1999)—Study 2—US—70m Brinkley et al. (2001)—AO—270 Wm, 279 AAm

TABLE 10.1. (continued)

*Note. ns*, not significant; S, small effect size; M, moderate effect size; L, large effect size; Sig-NR, statistically significant, but effect size was not reported/could not be calculated; "+" and "-" indicate the direction of the effect; PCL, Psychopathy Checklist; PPI, Psychopathic Personality Inventory; SRP-4, Hare Self-Report Psychopathy Scale-4; YPI, Youth Psychopathic Traits Inventory; US, university sample; CA, community adult sample; AO, adult offender sample; m, males; f, females; Wm, white males; AAm, African American males. Values separated by a slash (/) reflect the range of effects across samples. See Table 10.4 for LSRP and TriPM associations and Table 10.5 for LSRP and EPA associations.

Depression, and Treatment Rejection subscales of the PAI. Working with undergraduate and correctional samples, Sellbom (2011) found that LSRP Egocentricity was preferentially associated with Machiavellianism and narcissism, LSRP Callous was primarily associated with PPI Coldheartedness, and LSRP Antisocial was associated with various measures of impulsivity, anger, addiction, and antisociality. Other studies that have examined relations of the LSRP three-factor scales with differing criterion measures include Anderson and colleagues (2013), Christian and Sellbom (2016), Few and colleagues (2013), Shou and colleagues (2016), and Salekin and colleagues (2014). Notably, exploratory factor analyses that have included the three LSRP scales along with other psychopathy measures have indicated that Egocentricity and Callous load with other psychopathy subscales on a latent construct akin to "meanness" (see description of Triarchic Psychopathy Measure below) or antagonism, whereas the LSRP Antisocial scale loads together with psychopathy subscales reflecting disinhibition or social deviance (Marion et al., 2013; Sellbom & Phillips, 2013).

#### Summary

The LSRP scales hold promise as self-report measures of psychopathy. Nevertheless, the construct validity of the LSRP Primary scale is problematic. In several studies, this scale has been more highly related to measures of secondary psychopathy and antisocial behaviors than to measures of the core affective and interpersonal features of psychopathy. Indeed, Poythress and colleagues (2010) demonstrated that the nomological network associated with this LSRP scale bears greater similarity to that of PCL-R Factor 2 than Factor 1. Nevertheless, when examining associations with self-report psychopathy measures, such as the PPI, these concerns are somewhat mitigated in that the Primary scale is best associated with measures of interpersonal antagonism or "meanness." Moreover, research on whether greater differentiation is achieved by separating this scale into Egocentricity and Callous subscales, in line with the alternative three-factor LSRP model, is somewhat mixed. Brinkley and colleagues (2008), Christian and Sellbom (2016), Sellbom (2011), and Shou and colleagues (2016) have demonstrated promising convergent and discriminant validity for these subscales, but one study suggests potentially poorer validity relative to the original scales (Salekin et al., 2014). Most factor analyses indicate that both of these scales load on a broader antagonism or meanness dimension. Further research is needed to test the merits of separating the Primary scale into these two more specific measures.

Furthermore, it has become clear that the LSRP does not cover traits of fearlessness, stress immunity, or social potency associated with PPI Fearless Dominance (also referred to as "boldness"; see "Triarchic Psychopathy Measure" section later), a finding that bears implications for the LSRP's measurement of "primary psychopathy" (see Lilienfeld et al., 2012). Finally, although the convergent validity of the Secondary/Antisocial scale appears promising, this scale is substantially saturated by demoralization, presumably owing to an abundance of anger and frustration intolerance items.

In an effort to partially remedy some of these concerns, Christian and Sellbom (2016) recently developed an expanded 36-item version of the LRSP three-factor scales, with an emphasis on improving construct coverage. In a large community sample, these authors found superior convergent and discriminant validity relative to the original LSRP version, with a range of criteria including measures designed to index constructs described by the triarchic model of psychopathy (Patrick, Fowles, & Krueger, 2009). These findings warrant replication in other samples, however, before firm conclusions can be reached.

# Hare Self-Report Psychopathy Scale

# Construction

The SRP scale was constructed by Hare and his colleagues (see Hare, 1985) using a combination of rational, empirical, and internal consistency approaches. Hare began with 75 items that distinguished high from low PCL scorers, and refined this initial pool by selecting 29 items that correlated maximally with PCL total scores. Despite this itemselection strategy, the original version of the SRP correlated only modestly with the PCL as a whole (Hare, 1985) and lacked in coverage of certain traits considered central to psychopathy, including superficial charm, callousness, and dishonesty.

The SRP was further revised using item analytic techniques to increase its correlation with the PCL (now the PCL-R) and to increase coverage of the core personality traits of psychopathy (Hare, Hemphill, & Harpur, 1989). Like the PCL-R, this revised measure, the SRP-II, contained two factors, the first assessing core interpersonal and affective features of psychopathy and the second assessing impulsive–antisocial tendencies. SRP-II items included "I can read people like a book" (Factor 1) and "I have often done something dangerous just for the thrill of it" (Factor 2).

The SRP-II was superseded by the current third version (SRP-III, now formally labeled SRP-4; Paulhus, Neumann, & Hare, 2017).<sup>1</sup> Aims with this version were to (1) capture the factor structure of psychopathy as defined in the literature, (2) reduce the number of anxiety-related items, (3) improve coverage of the antisocial facet of psychopathy, and (4) increase the reliability of factor scores (see Williams, Paulhus, & Hare, 2007). The SRP-4 was first introduced in a 40-item experimental form (SRP-E; see Williams et al., 2007), but was later expanded to its current 64 items (Paulhus et al., 2017). A four-factor structure of Interpersonal Manipulation, Callous Affect, Erratic Lifestyle, and Criminal Tendencies has been found in community and university samples, both by test authors (Williams et al., 2007) and independent laboratories (Debowska, Boduszek, Kola, & Hyland, 2014; Mahmut, Menictas, Stevenson, & Homewood, 2011; Neal & Sellbom, 2012). A 28-item short form, hereafter referred to as SRP-4-SF, has been introduced as well (Paulhus et al., 2017); this form also fits the proposed factor structure adequately (e.g., Carré et al., 2013).

#### Psychometric Properties

Internal consistencies (alphas) were reported as high for overall scores on the original (.80; Hare, 1985) and second versions of the SRP (.91; Lilienfeld & Penna, 2001), but only adequate to marginal for factor scales of the latter version (alphas for SRP-II Factors 1 and 2 = .59 and .72, respectively; Lilienfeld & Penna, 2001). For the 64-item SRP-4 (Paulhus et al., 2017), Neal and Sellbom (2012) reported an alphas of .92 for the inventory as a whole in a large undergraduate sample, and .82, .78, .79, and .75 for its Interpersonal Manipulation, Callous Affect, Erratic Lifestyle, and Criminal Tendencies factor scales, respectively. Similar coefficients have been reported by Few and colleagues (2013), Seibert, Miller, Few, Zeichner, and Lynam (2011), and Wilson, Miller Zeichner, Lynam, and Widiger (2011). Moreover, Wilson and colleagues reported intercorrelations among the factor scales of the SRP-4 ranging from .29 (Callous Affect and Criminal Tendencies) to .60 (Interpersonal Manipulation and Callous Affect).

With regard to validity, empirical evidence indicated modest to large correlations for the original (Hare, 1985) and second versions of the SRP (Widiger et al., 1996), with a range of psychopathy-relevant criterion measures, including variants of the PCL-R and symptoms of antisocial personality disorder as defined in DSM-III and DSM-III-R (APA, 1980, 1987). More specifically, Paulhus and Williams (2002) reported that overall SRP-II scores correlated moderately with narcissism (r =.50) and to a low-moderate degree with Machiavellianism. Paulhus and Williams also reported significant correlations between SRP-II scores and all five dimensions of the FFM as measured by the Big Five Inventory (BFI; John & Srivastava, 1999)—that is, positively with Extraversion and Openness to Experience, and negatively with Agreeableness, Conscientiousness, and Neuroticism. These correlations appear broadly consistent with those reported for the PCL-R (Hart & Hare, 1994). Most recently, Lester, Salekin, and Sellbom (2013) found support for a 36-item, four-factor structure of the SRP-II, and reported correlations for these four factor scales with differing personality variables. The Interpersonal Dominance scale was strongly and preferentially associated with pride, emotional detachment, and openness to new experiences, along with low FFM Agreeableness. The Disinhibition/Impulsivity factor scale was primarily related to low Conscientiousness, low overall emotional intelligence, poor impulse control, and decreased feelings of social responsibility. This scale was also related to increased antisocial behavior and risky driving. The Fearlessness factor scale was even more strongly associated with risky driving behavior, while also being related to greater stress immunity, self-actualization, and functioning in interpersonal relationships, along with low Neuroticism and low Conscientiousness. Finally, the SRP-II Coldheartedness scale was associated with low scores on measures of empathy, agreeableness, feelings of social responsibility, and extraversion. It was also, to a lesser degree, related to an avoidant attachment style, emotional detachment, and blame externalization. Lester and colleagues concluded that the SRP-II should still be regarded as a "rich source" of psychopathy variance, particularly in light of concerns expressed about the SRP-4 restricting coverage of stress immunity and fearlessness (Neal & Sellborn, 2012).

Table 10.2 summarizes results for validation studies using the SRP-4 total score and subscale scores. In general, the SRP-4 total and factor scores show a pattern of convergent and discriminant associations that appear consistent with conceptual expectations. Of note, Sandvik and colleagues

Criteria	Total	IPM	CA	ELS	CT	Studies, sample type, and size
Psychopathy measures						
PCL Total	M+	M+	M+	M+	M+	Sandvik et al. (2012)—AO—80m
PCL Facet 1	ns	ns	ns	ns	ns	Sandvik et al. (2012)—AO—80m
PCL Facet 2	ns	ns	ns	ns	ns	Sandvik et al. (2012)—AO—80m
PCL Facet 3	L+	M+	M+	L+	L+	Sandvik et al. (2012)—AO—80m
PCL Facet 4	L+	M+	L+	L+	L+	Sandvik et al. (2012)—AO—80m
PPI Total	L+	L+	L+	L+	M+	Visser et al. (2012)—US—101m, 245f
PPI Fearless Dominance (and subscales)	ns/M+	S+/M+ ns/S+	S+/M+ ns/S+	M+ S+ L+	ns S+ S+ M+	Seibert et al. (2011)—US—76m, 54f Visser et al. (2012)—US—101m, 245f
PPI Self-Centered Impulsivity (and subscales)	S+/L+	S+/L+ S+/L+	ns/M+ ns/M+	S+ L+ S+ L+	S+ M+ S+ M+	Visser et al. (2012)—US—101m, 245f Seibert et al. (2011)—US—76m, 54f
PPI Coldheartedness	M+	M+ M+	L+ L+	S+ M+	S+ M+	Visser et al. (2012)—US—101m, 245f Seibert et al. (2011)—US—76m, 54f
CAPP Total	M+	M+	M+	ns	ns	Sandvik et al. (2012)—AO—80m
CAPP Attachment	ns	S+	ns	ns	ns	Sandvik et al. (2012)—AO—80m
CAPP Behavioral	L+	M+	M+	L+	M+	Sandvik et al. (2012)—AO—80m
CAPP Cognitive	M+	M+	M+	M+	M+	Sandvik et al. (2012)—AO—80m
CAPP Dominance	ns	ns	ns	ns	ns	Sandvik et al. (2012)—AO—80m
CAPP Emotional	ns	ns	M+	ns	ns	Sandvik et al. (2012)—AO—80m
CAPP Self	M+	M+	ns	ns	ns	Sandvik et al. (2012)—AO—80m
Inventory of Callous– Unemotional Traits	L+	M+	L+	M+	M+	Neal & Sellbom (2012)—US—178m, 428f
APSD Total	L+	L+	M+	L+	M+	Neal & Sellbom (2012)—US—178m, 428f
ASPD Callous– Unemotional	M+	M+	M+	S+	S+	Neal & Sellbom (2012)—US—178m, 428f
ASPD Narcissism	M+	L+	M+	M+	S+	Neal & Sellbom (2012)—US—178m, 428f
ASPD Impulsivity	M+	M+	S+	Ľ+	ns	Neal & Sellbom (2012)—US—178m, 428f

TABLE 10.2. Effect Size Estimates for SRP-4 Total and Factor Scales with Extratest Criterion Variables

Criteria	Total	IPM	CA	ELS	CT	Studies, sample type, and size
Personality Measures						
Neuroticism/Negative Emotionality/ Negative Affectivity/ Trait Anxiety	M– S+	ns S- S+ S+/M+	ns L– ns ns/S+	ns M– S+ S+	ns S– ns M+IL+	Seibert et al. (2011)—US—76m, 54f Visser et al. (2012)—US—101m, 245f Neal & Sellbom (2012)—US—178m, 428f Fite et al. (2010)—CA—335m Williams et al. (2010)—Study 1— US—15m, 34f
Extraversion/ Sociability/(low) Detachment	S– ns S+	ns S– ns	ns S– ns	S+ ns S+	ns S– ns	Seibert et al. (2011)—US—76m, 54f Visser et al. (2012)—US—101m, 245f Neal & Sellbom (2012)—US—178m, 428f Williams et al. (2010)—Study 1— US—15m, 34f
Agreeableness/(low) Antagonism	S- M- M-	L– S– M–	L– S– M–	M– ns M–	S– S– S–	Seibert et al. (2011)—US—76m, 54f Visser et al. (2012)—US—101m, 245f Neal & Sellbom (2012)—US—178m, 428f Williams et al. (2010)—Study 1— US—15m, 34f
Conscientiousness/ Control/(low) Disinhibition	M- L- M-	ns M–	ns S–	L- L-	ns M– L–	Seibert et al. (2011)—US—76m, 54f Visser et al. (2012)—US—101m, 245f Neal & Sellbom (2012)—US—178m, 428f Williams et al. (2010)—Study 1— US—15m, 34f
Openness	ns ns	ns ns	ns ns	S+ ns	ns ns	Seibert et al. (2011)—US—76m, 54f Visser et al. (2012)—US—101m, 245f Williams et al. (2010)—Study 1— US—15m, 34f
Humility–Honesty	L- M-	L- M-	M- M-	M- M-	M- M-	Visser et al. (2012)—US—101m, 245f Neal & Sellbom (2012)—US—178m, 428f
Psychoticism	M+	M+	S+	S+	S+	Neal & Sellbom (2012)—US—178m, 428f
Machiavellianism	L+					Williams et al. (2010)—Study 1— US—15m, 34f
Narcissism/ Grandiosity	M+					Williams et al. (2010)—Study 1— US—15m, 34f
Impulsivity/Sensation Seeking/Behavioral Approach	L+ M+/L+	L+ M+/L+	S+ S+/M+	L+ M+ L+	S+ S+IM+	Visser et al. (2012)—US—101m, 245f Neal & Sellbom (2012)—US—178m, 428f

Criteria	Total	IPM	CA	ELS	CT	Studies, sample type, and size
ThrilL–Adventure Seeking/(low)Harm Avoidance/(low) Behavioral Inhibition	S– ns/S+	S– ns	Ns S+	Ns ns	S– ns	Visser et al. (2012)—US—101m, 245f Neal & Sellbom (2012)—US—178m, 428f
Reactive Aggression/ Hostility	L+	L+	M+/L+	M+	L+	Neal & Sellbom (2012)—US—178m, 428f
	L+	M+	M++	M++	M+	Miller, Hyatt, et al. (2014)— CA—72m, 32f
		S+	S+	S+	S+	Fite et al. (2010)—CA—335m
		S+	S+	ns	ns	Watt & Brooks (2012)—CA—101m, 169f
Proactive Aggression	M+	M+	M+	M+	M+	Neal & Sellbom (2012)—US—178m, 428f
	L+	L+	M+	M+	L+	Miller, Hyatt, et al. (2014)— CA—72m, 32f
		S+	M+	S+	S+	Fite et al. (2010)—CA—335m
		S+	S+	ns	S+	Watt & Brooks (2012)—CA—101m, 169f
Empathy scales	L–	M-	L–	M-	M-	Neal & Sellbom (2012)—US—178m, 428f
	M-	M-	M-	ns	ns	Mahmut et al. (2008)—US—27m, 74f
		S-	S-/L-	ns S+	ns	Watt & Brooks (2012)—CA—101m, 169f
Empathy scales	S-	M-		n	5	Seara-Cardoso et al. (2012)— US—124m
	S–	Ν	1—	n	5	Seara-Cardoso et al. (2013)— US—100f
Blame Externalizing	M+	M+	S+	M+	S+	Neal & Sellbom (2012)—US—178m, 428f
Behavioral variables						
Alcohol misuse	M+	M+	S+	L+	M+	Neal & Sellbom (2012)—US—178m, 428f
	S+	S+	S+	S+		Vitacco et al. (2014)—CA—417m
		Ns	ns	M+	S+	Watt & Brooks (2012)—CA—101m, 169f
Drug misuse	M+	S+	S+	M+	M+	Neal & Sellbom (2012) – US – 178m, 428f
	S+	S+	S+	S+		Vitacco et al. (2014) – CA – 417m
Self-reported	L+	L+	M+	M+	L+	Visser et al. (2012)—US—101m, 245f
antisociality	L+	M+/L+	M+	M+IL+	L+	Neal & Sellbom (2012)—US—178m, 428f
	L+	M+	M+	M+	L+	Miller, Hyatt, et al. (2014)— CA—72m, 32f
	M+	S+	M+	M+		Vitacco et al. (2014)—CA—417m

	ucuj					
Criteria	Total	IPM	CA	ELS	CT	Studies, sample type, and size
Self-reported violence	Ľ+	M+	M+	M+	L+	Miller, Hyatt, et al. (2014)— CA—72m, 32f
Criminality/ delinquency	S+	M+ S+	M+ S+	M+ S+	M+	Fite et al. (2010)—CA—335m Vitacco et al. (2014)—CA—417m
Violence	S+	S+ S+	S+ S+	S+ S+	S+	Fite et al. (2009)—CA—335m Vitacco et al. (2014)—CA—417m
Self-reported cheating	L+					Williams et al. (2010)—Study 1— US—15m, 34f
Objective cheating	S+					Williams et al. (2010)—Study 2— US—35m, 72f
Cheating motivation: Morality	L+					Williams et al. (2010)—Study 3— US—82m, 141f
Cheating motivation: Fear	M+					Williams et al. (2010)—Study 3— US—82m, 141f
Cheating motivation: Unrestrained	S-					Williams et al. (2010)—Study 3— US—82m, 141f
Laboratory tasks Pain tolerance	S+	ns	S+/M+	S+	ns S+	Miller, Hyatt, et al. (2014)— CA—72m, 32f
Gambling Task (poor) performance	M-	ns	ns	S-	S-	Mahmut et al. (2008)—US—27m, 74f
Empathy response: Fearful faces	M-	;	S-	Ν	⁄I—	Seara-Cardoso et al. (2012)— US—124m
	ns		S–	1	ns	Seara-Cardoso et al. (2013)— US—100f
Empathy response: Sad faces	ns		ns	1	ıs	Seara-Cardoso et al. (2012)— US—124m
	S-	S-		ns		Seara-Cardoso et al. (2013)— US—100f
Empathy response: Happy stories	ns	S-		ns		Seara-Cardoso et al. (2012)— US—124m
	ns		ns	1	ıs	Seara-Cardoso et al. (2013)— US—100f
Empathy response: SAD stories	Ns		ns	1	ıs	Seara-Cardoso et al. (2012)— US—124m
	S-		S-	1	ıs	Seara-Cardoso et al. (2013)— US—100f

Criteria	Total	IPM	CA	ELS	CT	Studies, sample type, and size
Moral dilemma: Impersonal	M-	М	[	S-	_	Seara-Cardoso et al. (2012)— US—124m
L	ns	S	_	N	S	Seara-Cardoso et al. (2013)— US—100f
Moral dilemma: Personal	S-	S	_	n	S	Seara-Cardoso et al. (2012)— US—124m
	ns	n	S	n.	S	Seara-Cardoso et al. (2013)— US—100f
Victim detection accuracy (gait)	M+	M+	S+			Wheeler et al. (2009)—US—47m
Vulnerability cue detection (gait)	ns	ns	ns			Wheeler et al. (2009)—US—47m
Amygdala reactivity (fear)		S-	ns	ns	ns	Carré et al. (2013)—CA—83m, 117f
Amygdala reactivity (anger)		ns	ns	S+	ns	Carré et al. (2013)—CA—83m, 117f
Ventral striatum reactivity (reward)		ns	ns	S-	S+	Carré et al. (2013)—CA—83m, 117f

Note. IPM, interpersonal manipulation; CA, callous affect; ELS, erratic lifestyle; CT, criminal tendencies; ns, not significant; S, small effect size; M, moderate effect size; L, large effect size; "+" and "-" indicate the direction of the effect; PCL, Psychopathy Checklist; PPI, Psychopathic Personality Inventory; CAPP, Comprehensive Assessment of Psychopathic Personality; APSD, Anti-social Process Screening Device—Youth Version; US, university sample; CA, community adult sample; AO, adult offender sample; m, males; f, females. Values separated by a line (1) reflect the range of effects across studies. See Table 10.1 for SRP-4 and LSRP associations; Table 10.4 for SRP-1II and TriPM associations; and Table 10.5 for SRP-4 and EPA associations.

(2012) found that in relation to psychopathy as assessed by the PCL-R and the interview-based Comprehensive Assessment of Psychopathic Personality (CAPP; Cooke & Logan, Chapter 9, this volume), SRP-4 scores were associated more with behavioral features than with affective-interpersonal traits. Moreover, these authors found very little actual discrimination across SRP-4 factors for several other criteria, including measures of aggression, antisociality, and violence. Finally, findings of inconsistent and small to nonsignificant associations with boldness and affiliated traits (e.g., fearlessness, low negative affectivity, social potency; see also Table 10.4) indicate that these components of psychopathy are deemphasized in the SRP-4 operationalization of psychopathy.

#### Summary

The SRP in its different versions has demonstrated effectiveness in various samples. The SRP-II has

shown a four-factor structure, with promising convergent and discriminant validity for scale measures of the factors (Lester et al., 2013). The authors of the SRP-4 (e.g., Williams et al., 2007) removed fear- and anxiety-related items from the inventory and added items reflecting antisocial behavior to bring its factors more in line with those of the PCL-R (Hare, Neumann, & Mokros, Chapter 3, this volume); however, this change in item content led to a reduction in coverage of the "boldness" domain of psychopathy relative to the SRP-II (i.e., due to exclusion of items indexing fearlessness and stress immunity; Lilienfeld, Watts, Smith, & Latzman, Chapter 8, this volume), in favor of antisocial items that are less specific in their relations with criterion measures of differing types (per results for SRP-4's Criminal Tendencies scale in Table 10.2). In addition, the weak associations reported by Sandvik and colleagues (2012) for SRP-4 scores with "core" psychopathic traits as indexed by the PCL-R and CAPP scores call for more validation research, with larger participant samples to clarify the extent of interface between the PCL-R and SRP-4.

#### The Psychopathic Personality Inventory

#### Construction

Lilienfeld (1990) developed the PPI to assess psychopathic traits in noncriminal (e.g., student, community) samples, although the inventory has since been used with criminal and psychiatric samples. The PPI was developed through an iterative exploratory process (see Tellegen & Waller, 2008), with item-level factor analyses used to delineate content subdomains. It comprises 187 items presented in a 4-point Likert-type format. The PPI provides a total score index of global psychopathy, along with scores on eight content scales (subscales) that index specific facets of psychopathy. The PPI also contains three validity scales for detecting positive impression management (Virtuous Responding), overreporting (Deviant Responding), and careless or random responding (Inconsistent Responding). Lilienfeld and Widows (2005) introduced a revised version (PPI-R) that is (1) shorter in length (154 items); (2) lower in average reading level, making it more appropriate for criminal and other disadvantaged samples; (3) superior in terms of item psychometrics; and (4) free from items with culturally idiomatic wordings, making it more amenable to international translation and usage.

The eight PPI subscales, retained in the PPI-R, are as follows: Machiavellian Egocentricity, indexing a ruthless willingness to manipulate and take advantage of others (e.g., "I sometimes try to get others to 'bend the rules' for me if I can't change them any other way"); Social Influence (formerly Social Potency), tapping interpersonal impact and skill at influencing others (e.g., "Even when others are upset with me, I can usually win them over with my charm"); Fearlessness, assessing a willingness to take physical risks and an absence of anticipatory anxiety (e.g., "Making a parachute jump would really frighten me" [reverse keyed]); Coldheartedness, indexing callousness versus empathic concern and emotional sensitivity-insensitivity (e.g., "I have had 'crushes' on people that were so intense that they were painful" [reverse keyed]); Rebellious Nonconformity (formerly Impulsive Nonconformity), assessing a flagrant disregard for convention (e.g., "I sometimes question authority figures 'just for the hell of it'"); Blame Externalization (formerly Alienation), capturing a tendency to attribute responsibility for one's mistakes to others (e.g., "When I'm in a group of people who do something wrong, somehow it seems like I'm usually the one who ends up getting blamed"); Carefree Nonplanfulness, tapping an insouciant attitude toward the future (e.g., "I weigh the pros and cons of major decisions carefully before making them" [reverse keyed]); and Stress Immunity, indexing sangfroid and absence of tension in anxiety-provoking situations (e.g., "I can remain calm in situations that would make many other people panic").

Initial exploratory factor analyses of the eight PPI subscale scores revealed a two-factor structure (Benning, Patrick, Hicks, Blonigen, & Krueger, 2003), which has been replicated in some (e.g., Benning, Patrick, & Iacono, 2005; Ross, Benning, Patrick, Thompson, & Thurston, 2009) but not all (e.g., Neumann, Malterer, & Newman, 2008) studies. In this two-factor structure, PPI Social Potency, Fearlessness, and Stress Immunity subscales load on a first factor, often termed Fearless Dominance (FD). FD has aligned conceptually with the construct of boldness from the increasingly influential triarchic model of psychopathy (Patrick et al., 2009; see also Lilienfeld et al., Chapter 8, this volume; also see Patrick, Chapters 1 and 18, this volume). PPI Machiavellian Egocentricity, Rebellious Nonconformity, Blame Externalization, and Carefree Nonplanfulness loaded on a second factor, termed Impulsive Antisociality by Benning and colleagues (2003), but renamed Self-Centered Impulsivity (SCI) by Lilienfeld and Widows (2005). SCI bears marked similarities to the Disinhibition construct of the triarchic model (Patrick et al., 2009). The Coldheartedness subscale of the PPI, which assesses affective deficits traditionally regarded as central to psychopathy (e.g., "lovelessness" and "guiltlessness," in the words of McCord & McCord [1964]), does not load distinctively on either higher-order factor and has been treated as a stand-alone dimension in some studies examining correlates of the PPI and PPI-R. Coldheartedness is conceptually similar to the Meanness construct of the triarchic model (Patrick et al., 2009), although it is less overtly "antagonistic" in content.

Notably, in contrast with the two factors of Hare's PCL-R, which are moderately correlated, the two higher-order PPI factors are essentially orthogonal, with a weighted mean correlation of only r = .12 across differing studies (Marcus, Fulton, & Edens, 2013). As such, and considering the content of the PPI scales that define them, the two PPI factors can be viewed as contrasting configu-
rations of basic trait dispositions relevant to distinct clinical features of psychopathy (see Lynam, Miller, & Derefinko, Chapter 11, this volume).

### Psychometric Properties of the PPI and PPI-R<sup>2</sup>

In undergraduate samples, Lilienfeld and Andrews (1996; see also Chapman, Gremore, & Farmer, 2003; Lilienfeld, 1990) reported alphas of .90 to .93 for the PPI as a whole, and alpha coefficients from .70 to .90 for its eight subscales, with most coefficients in the .80–.90 range. Alphas for the somewhat shorter subscales of the PPI-R are comparable to those of the PPI (Lilienfeld & Widows, 2005). Lilienfeld and Andrews reported a test–retest reliability of .95 for total scores on the PPI over a mean 26-day interval, with retest reliabilities of the subscales ranging from .82 to .94 (see also Chapman et al., 2003).

In the initial PPI validation study, Lilienfeld and Andrews (1996) reported that its total score displayed convergent and discriminant validity with self-report measures of psychopathy and antisocial behavior, including the CPI So scale (r =-.59), MMPI-2 Antisocial Practices content scale (r's = .56 and .58 in two samples), and the Personality Diagnostic Questionnaire-Revised ASPD scale (r's = .58 and .43 in two samples), as well as with theoretically relevant self-report scales from Tellegen's (1978/1982) Multidimensional Personality Questionnaire (MPQ), including Social Potency (r = .39), Aggression (r = .38), Harm Avoidance (r = -.55), Control (r = -.27), and Traditionalism (r = -.20). In addition, the PPI total score displayed convergent validity with a measure of peer-rated Cleckley psychopathy (r = .45), interview-rated Cleckley psychopathy (r = .60), and with ASPD (r = .59) and Narcissistic Personality Disorder (r = .35) as measured by the Structured Clinical Interview for DSM-III-R (Spitzer, Williams, & Gibbon, 1987). The PPI total score also displayed discriminant validity (weak or nonsignificant correlations) based on associations with several constructs that are conceptually unrelated to psychopathy, including selected measures of schizotypy, psychosis-proneness, and depression. Salekin, Trobst, and Krioukova (2001) similarly reported that the correlates of PPI are largely specific to features of Cluster B (dramatic, emotional) personality disorders, lending further support to its discriminant validity. Lilienfeld and Andrews also used hierarchical multiple regression techniques to examine the incremental valid-

ity of the PPI above and beyond other self-report measures of psychopathy and antisocial behavior. They used both peer-rated and interviewer-rated Cleckley psychopathy as dependent measures. In both cases, the MMPI-2 Pd scale, MMPI-2 Antisocial Practices Content (ASP) scale, PDQ-R ASPD scale, and MMPI ASPD scale (Morey, Blashfield, Webb, & Jewell, 1988) were entered on the first step, followed by the PPI total score on the second step. For peer-rated Cleckley psychopathy, the addition of the PPI increased prediction by 10% of the variance (p < .01), whereas for interviewerrated Cleckley psychopathy, the addition of the PPI increased prediction by 38% of the variance (p < .001). These analyses demonstrate that the PPI contains meaningful variance not shared with several self-report measures of psychopathy and antisocial behavior.

Extensive published data also exist on the correlates of scores on the two major PPI higher-order factors of FD and SCI-in some cases, estimated using trait scales from inventories such as the MPQ or NEO Personality Inventory-Revised (NEO-PI-R). Notably, these factors exhibit strikingly divergent, in some cases, even opposing, relations with various criterion measures. In a sample of 353 adult community males, Benning, Patrick, and Iacono (2005) reported that PPI-FD was positively correlated with educational level, high school class rank, and adult antisocial behavior. By contrast, PPI-SCI was negatively correlated with educational achievement, income, verbal intelligence, and age of first substance use, and positively correlated with both child and adult antisocial behaviors. In addition, PPI-FD was primarily associated (positively) with MPQ scales assessing Positive Emotionality, such as Well-Being, and secondarily associated (negatively) with MPQ scales assessing Negative Emotionality, such as Stress Reaction. PPI Factor 2, in contrast, was moderately to highly associated (positively) with MPQ scales assessing Negative Emotionality, particularly Alienation and Aggression, and (negatively) with MPQ scales assessing Constraint, particularly Control versus Impulsiveness. Benning and colleagues suggested that PPI-FD may reflect emotional resilience (see also Block, 1965, for a discussion of "ego resilience"), whereas PPI-SCI may reflect a broad predisposition toward externalizing behavior. This possibility is consistent with analyses from prison and substance abuse treatment samples indicating that although PPI-SCI is positively associated with suicide ideation and attempts, PPI-FD is negatively associated with such variables (Douglas et al., 2008). Hence, some features of psychopathy, especially those linked to high interpersonal influence and low anticipatory anxiety, may exert a protective (buffering) influence against negative affectivity and suicidal thinking/behavior in the presence of impulsivity (Sellbom, 2015; Venables et al., 2015).

More recently, two large meta-analyses have examined the differential correlates of the PPI and PPI-R higher-order dimensions (see Table 10.3 for a summary of common findings). Marcus and colleagues (2013) and Miller and Lynam (2012) both found that the magnitude of the association between FD and PCL-R Factor 1 was only small to medium, consistent with suggestions (Lilienfeld et al., 2012) that FD assesses features of psychopathy (e.g., boldness) that are underrepresented in the

PCL-R. Marcus and colleagues found a small association between FD and PCL-R Factor 2, whereas Miller and Lynam documented only a negligible association. Furthermore, Marcus and colleagues reported small associations between PPI Coldheartedness and both PCL-R factors (Miller and Lynam did not examine the correlates of Coldheartedness). Both meta-analyses also documented the associations between PPI and normal-range personality dimensions derived from three-factor (MPO) and five-factor models. Taken together, the findings of Marcus and colleagues and Milller and Lynam suggest that whereas PPI-FD appears to detect largely (albeit not exclusively) adaptive features associated with psychopathy, PPI-SCI appears to detect largely maladaptive features associated with psychopathy.

Criteria	FD	SCI	Cold	Meta-analyses
Psychopathy measures				
PCL Total	S to M+	L+		Marcus et al. (2013) Miller & Lynam (2012)
PCL Factor 1	S to M+ S to M+	S to M+ M to L+	S to M+	Marcus et al. (2013) Miller & Lynam (2012)
PCL Factor 2	S to M+ ns	M to L+ L+	S to M+	Marcus et al. (2013) Miller & Lynam (2012)
Personality measures				
Positive Emotionality	M to L+	ns	S to M–	Marcus et al. (2013)
Negative Emotionality	M to L–	M+	S to M–	Marcus et al. (2013)
Constraint	ns	M to L-	S to M–	Marcus et al. (2013)
Extraversion	L+	S-		Miller & Lynam (2012)
Neuroticism	L-	M+		Miller & Lynam (2012)
Conscientiousness	ns	L–		Miller & Lynam (2012)
Agreeableness	S-	L–		Miller & Lynam (2012)
Openness	S to M+	ns		Miller & Lynam (2012)
Sensation Seeking	L+ L+	L+ M to L+	ns	Marcus et al. (2013) Miller & Lynam (2012)

TABLE 10.3. Effect Size Estimates for PPI/PPI-R Factor Scores with Common Extratest Criterion Variables from Meta-Analyses

Note. Ns, not significant; S, small effect size; M, moderate effect size; L, large effect size; "+" and "-" indicate the direction of the effect; PCL, Psychopathy Checklist.

Validation efforts have also focused on a 56item PPI Short Form (PPI-SF). Kastner, Sellbom, and Lilienfeld (2012) compared the short and full-length forms of the PPI in incarcerated and nonincarcerated samples, examining the internal consistency, convergent validity, and discriminant validity of the two measures. The subscales of the PPI-SF generally exhibited lower internal consistencies than their full-form counterparts given their reduced length, but showed acceptable interitem correlations (AICs). However, Kastner and colleagues found that in several instances, scores for the full PPI were significantly more highly correlated with convergent validation measures, particularly in the prison sample, and they recommended using the long form of the PPI rather than the short form to assess psychopathy in male inmates.

To address some of the limitations of the PPI-SF identified by Kastner and colleagues (2012), a new version of the PPI-SF was recently constructed (Tonnaer, Cima, Sijtsma, Uzieblo, & Lilienfeld, 2013). Rather than selecting the items for each subscale that demonstrated the highest factor-analytically-derived loading, Tonnaer and colleagues used a nonparametric item response theory (IRT) model called Mokken scale analysis to determine scalability for individual items and subscales, estimate item popularity, and assess item discrimination. Furthermore, they developed criterion reference scores from which z-scores can be obtained, using mean responses of healthy participants as the criteria. They then evaluated the properties of this revised PPI-SF in forensic and nonforensic participant samples and found good internal consistency for total scores in both (alphas = .85 and .89). Internal consistencies (alphas) for individual subscales ranged from .57 (Stress Immunity) to .82 (Machiavellian Egocentricity and Social Potency) in the forensic sample, and from .65 (Carefree Nonplanfulness) to .85 (Blame Externalization) in the nonforensic sample. The revised PPI-SF also demonstrated adequate convergent validity, particularly with PCL-R scores and aggression measures. The authors concluded that this new version may have particular utility for risk assessment.

#### Summary and Unresolved Questions

The PPI and PPI-R hold considerable potential as self-report measures of psychopathy. The PPI total score shows robust associations with measures of psychopathy and antisocial behavior, and the PPI's two higher-order dimensions exhibit promising convergent and discriminant validity in relation to a range of relevant criterion measures.

At the same time, PPI-FD appears to detect a different set of dispositional tendencies than PCL-R Factor 1. The association between scores on the two dimensions is only modest (Malterer et al., 2009; Marcus et al., 2013), and FD is much more closely allied conceptually and empirically to boldness within the triarchic model than is PCL-R Factor 1 (see e.g., Sellbom & Phillips, 2013). Moreover, the finding that FD is linked to psychologically adaptive correlates has been a source of considerable debate in the psychopathy literature (e.g., Lilienfeld, 2013; Lilienfeld et al., 2012; Lynam & Miller, 2012; Miller & Lynam, 2012). Lilienfeld and colleagues (Chapter 8, this volume) provide detailed coverage of this debate and discuss implications of the FD/boldness concept for our understanding of psychopathy-including the idea that psychopathy as described by Cleckley (1941/1988) may reflect a compound condition encompassing several different attributes, as opposed to a unitary "syndrome," and that FD may interact statistically with SCI and perhaps Coldheartedness in producing malignant interpersonal outcomes such as deceptive exploitation and sexual predation. Research on this intriguing interactional hypothesis is promising (e.g., Kastner & Sellbom, 2012; Marcus & Norris, 2014; Rock, Sellbom, Ben-Porath, & Salekin, 2013) but provisional, and should be a priority for future research on the PPI and other psychopathy measures.

Other important questions regarding the construct validity of the PPI and PPI-R remain as well. Research on relations of the PPI and its factors with psychopathy-relevant laboratory measures such as performance on frontal lobe and response inhibition tasks, fear-potentiated startle, and brain activation during affective and cognitive processing as assessed by neuroimaging has been accumulating (e.g., Benning, Patrick, & Iacono, 2005; Gordon, Baird, & End, 2004; Sellbom & Verona, 2007; Vieira & Marsh, 2014), but more work along these lines is needed. In addition, the nomological network of PPI Coldheartedness, a subscale that is sometimes excluded from studies of the PPI, requires further elucidation. Given that this subscale ostensibly indexes the lack of emotional sensitivity that has been conceptualized as central to psychopathy (e.g., McCord & McCord, 1964), a better understanding of its correlates will be essential for advancing conceptualization and assessment of this still enigmatic condition.

#### Triarchic Psychopathy Measure

#### Construction

The TriPM (Patrick, 2010b) was developed to assess the three constructs of Patrick, Fowles, and Krueger's (2009) triarchic conceptualization of psychopathy. The triarchic model was formulated to reconcile and integrate various historical and contemporary theories and operationalizations of the psychopathy construct. Based on a detailed review of the extant psychopathy literature, Patrick and colleagues (2009; see also Patrick, 2010a; Patrick & Drislane, 2015) organized the commonalities and uniquenesses of these models into three broad phenotypic domains of Boldness (encompassing fearlessness, social dominance, and low stress reactivity), Meanness (callousness, exploitativeness, interpersonal detachment), and Disinhibition (impulsivity, poor self-regulation, low frustration tolerance).

The 58-item TriPM grew out of work with two separate questionnaire inventories designed to operationalize theoretical models of externalizing psychopathology (Krueger et al., 2007) and fear/fearlessness/threat sensitivity (Kramer, Patrick, Krueger, & Gasperi, 2012; see also Patrick & Drislane, 2015). The Disinhibition and Meanness scales comprise items from the Externalizing Spectrum Inventory (ESI; Krueger et al., 2007) and, more specifically, items that effectively index a broad dimension of general externalizing proneness (Disinhibition), entailing impulsive-irresponsible, rule-breaking tendencies, and a subsidiary or residual dimension of callous-aggression (Meanness), reflecting uncaring/exploitative tendencies. The Boldness items were derived from a separate inventory that was designed to index differing thematic expressions of fearless-dominant tendencies that relate in turn to a broad biobehavioral dimension of fear/fearlessness (Kramer et al., 2012; Vaidyanathan, Patrick, & Bernat, 2009) or threat sensitivity (Yancey, Venables, & Patrick, 2016). The TriPM places primary emphasis on assessment of psychopathy in terms of these distinguishable facets, as opposed to psychopathy as a unitary global construct (Patrick & Drislane, 2015; see also Skeem, Polaschek, Patrick, & Lilienfeld, 2011).

#### Psychometric Properties

Cronbach's alpha coefficients for the three TriPM scales have been acceptable to high across various studies, ranging from .77 to .89 for Boldness, .83 to

.91 for Meanness, and .79 to .89 for Disinhibition (Poy, Segarra, Esteller, López, & Moltó, 2014; Sellbom & Phillips, 2013; Smith, Lilienfeld, Coffey, & Dabbs, 2013; Stanley, Wygant, & Sellbom, 2013; Venables, Hall, & Patrick, 2013). Moreover, the scales have been shown to correlate at differing levels with one another. Meanness and Disinhibition are moderately intercorrelated (e.g., r's = .36 in Stanley et al., 2013; .45 in Drislane et al., 2014; .54 in Strickland et al., 2013), whereas Meanness and Boldness tend to be modesty correlated (e.g., r's = .20, .23, and .17, respectively, in these same three studies), and Boldness and Disinhibition are minimally interrelated (e.g., r's = -.03, -.10, and -.05, respectively).

Table 10.4 shows associations between TriPM scales and external criteria across studies, with remarkably consistent patterns of findings. Much of the validity work to date has centered on the degree to which the TriPM can explain variance in other psychopathy measures per hypotheses derived from triarchic theory, which in turn would support the construct validity of the scale scores. By and large, these associations confirm that other measurement modalities are indeed associated with the three triarchic domains in ways that the theory would predict. For instance, measures that are substantially based on the PCL model (e.g., PCL, SRP-4, LSRP, and Antisocial Process Screening Device [APSD]) have small to nonexistent associations with boldness (typically, only the interpersonal facets), whereas others that have incorporated such traits into their measurement (e.g., PPI, DSM-5 Section III, NEO-PI-R Psychopathy Resemblance Index, EPA [see Table 10.5] below]) evince moderate to large correlations with boldness as expected.

#### Summary

The TriPM is a promising self-report questionnaire, as demonstrated by its encouraging convergent and discriminant validity. The TriPM domains account for variance in other psychopathy measures to a degree that is theoretically expected from triarchic theory. The TriPM domain scales also converge with dimensional personality traits from established models in ways that would be conceptually expected; indeed, these findings indicate that, in particular at the facet level, TriPM domain scores can easily be "re-created" via constellations of personality traits. Moreover, although the Boldness construct has encountered criticism with respect to its relevance to psychopathy (e.g., Miller

Criteria	Bold	Mean	Dis	Studies, sample type, and size
Psychopathy measures				
PCL Total	S+	M+	M+	Patrick (2010a)—AO—148m
	S+	M+	M+	Venables et al. $(2014)$ —AO—169m
	S+	M+	M+	Wall et al. (2015)—AO—152m
PCL Facet 1	S+	S+	S+	Patrick (2010a)—AO—148m
	M+	S+	S+	Venables et al. (2014)—AO—169m
	M+	S+	S-	Wall et al. (2015)—AO—152m
PCL Facet 2	ns	S+	ns	Patrick (2010a)—AO—148m
	ns	M+	ns	Venables et al. (2014)—AO—169m
	ns	S+	ns	Wall et al. (2015)—AO—152m
PCL Facet 3	ns	ns	M+	Patrick (2010a)—AO—148m
	ns	S+	M+	Venables et al. (2014)—AO—169m
	S+	M+	M+	Wall et al. (2015)—AO—152m
PCL Facet 4	S+	S+	M+	Patrick (2010a)—AO—148m
	ns	M+	M+	Venables et al. (2014)—AO—169m
	ns	M+	M+	Wall et al. (2015)—AO—152m
PPI Total	M+	L+	M+	Patrick (2010a)—AO—148m
	L+	L+	L+	Drislane et al. (2014)—US—271m, 347f
	M+	L+	M+	Sellbom & Phillips (2013)—AO—209f
	Ľ+	L+	L+	Sellbom & Phillips (2013)—US—204m, 423f
	L+	L+	M+	Stanley et al. (2013)—AO—93m, 48f
PPI Fearless Dominance	L+	M+	ns	Drislane et al. (2014)—US—271m, 347f
(and subscales)	L+	S+	ns	Sellbom & Phillips (2013)—AO—209f
	L+	M+	S+	Sellbom & Phillips (2013)—US—204m, 423f
	L+	S+	S-	Stanley et al. (2013)—AO—93m, 48f
	L+	M+	ns	Anderson et al. (2014)—CA—83m, 65f
	L+	S+	S-	Anderson et al. (2014)—US—252m, 211f
	L+	M+	ns	Crego & Widiger (2014)—CA—178m, 299f
PPI Self-Centered Impulsivity	ns	L+	L+	Drislane et al. (2014)—US—271m, 347f
(and subscales)	ns	L+	L+	Sellbom & Phillips (2013)—AO—209f
	S+	L+	L+	Sellbom & Phillips (2013)—US—204m, 423f
	S+	L+	L+	Stanley et al. (2013)—AO—93m, 48f
	S+	L+	L+	Anderson et al. (2014)—CA—83m, 65f
	S-	L+	L+	Anderson et al. (2014)—US—252m, 211f
	ns	L+	L+	Crego & Widiger (2014)—CA—178m, 299f
PPI Coldheartedness	S+	M+	ns	Drislane et al. (2014)—US—271m, 347f
	S+	M+	ns	Sellbom & Phillips (2013)—AO—209f
	S+	L+	S+	Sellbom & Phillips (2013)—US—204m, 423f
	S+	L+	S+	Stanley et al. (2013)—AO—93m, 48f
	S+	M+	ns	Anderson et al. (2014)—CA—83m, 65f
	S+	S+	ns	Anderson et al. (2014)—US—252m, 211f
	5+	L+	5+	Crego & Widiger (2014)—CA—178m, 299f

## TABLE 10.4. Effect Size Estimates for TriPM Domain Scales with Extratest Criterion Variables

(continued)

TABLE 10:4. (continued)				
Criteria	Bold	Mean	Dis	Studies, sample type, and size
LSRP Total	ns	M+	S+	Patrick (2010a)—AO—148m
	ns	L+	M+	Drislane et al. (2014)—US—271m, 347f
	ns	L+	L+	Sellbom & Phillips (2013)—AO—209f
	S+	L+	L+	Sellbom & Phillips (2013)—US—204m, 423f
LSRP Primary/Egocentricity/	S+	L+	L+	Drislane et al. (2014)—US—271m, 347f
Callous	S+	L+	M+	Sellbom & Phillips (2013)—AO—209f
	S+	L+	M+	Sellbom & Phillips (2013) – US – 204m, 423f
LSRP Secondary/Antisocial	S-	M+	L+	Drislane et al. (2014)—US—271m, 347f
	S-	M+	L+	Sellbom & Phillips (2013)—AO—209f
	ns	M+	L+	Sellbom & Phillips (2013)—US—204m, 423f
SRP-4 Total	M+	L+	M+	Patrick (2010a)—AO—148m
	M+	L+	M+	Drislane et al. (2014)—US—271m, 347f
SRP-4 Interpersonal	S+	L+	M+	Drislane et al. (2014)—US—271m, 347f
Manipulation	S+	L+	L+	Crego & Widiger (2014)—CA—178m, 299f
SRP-4 Callous Affect	M+	L+	S+	Drislane et al. (2014)—US—271m, 347f
	S+	L+	L+	Crego & Widiger (2014)—CA—178m, 299f
SRP-4 Erratic Lifestyle	M+	M+	L+	Drislane et al. (2014)—US—271m, 347f
	S+	L+	L+	Crego & Widiger (2014)—CA—178m, 299f
SRP-4 Criminal Tendencies	S+	M+	M+	Drislane et al. (2014)—US—271m, 347f
	S+	L+	L+	Crego & Widiger (2014)—CA—178m, 299f
YPI Total	M+	L+	M+	Patrick (2010a)—AO—148m
	M+	L+	M+	Drislane et al. (2014)—US—271m, 347f
YPI Grandiose–Manipulative	S+	M+	M+	Drislane et al. (2014)—US—271m, 347f
YPI Callous–Unemotional	M+	L+	S+	Drislane et al. (2014)—US—271m, 347f
YPI Impulsive-Irresponsible	S+	M+	Ľ+	Drislane et al. (2014)—US—271m, 347f
Child Psychopathy scale	ns	M+	M+	Drislane et al. (2014)—US—271m, 347f
NEO-PI-R Psychopathy Resemblance Index	L+	M+	M+	Poy et al. (2014)—US—96m, 253f
Inventory of Callous-	ns	M+	S+	Drislane et al. (2014)—US—271m, 347f
Unemotional Traits	S+	L+	M+	Sellbom & Phillips (2013)—US—204m, 423f
APSD Total	ns	L+	L+	Drislane et al. (2014)—US—271m, 347f
	S+	L+	Ľ+	Sellbom & Phillips (2013)—US—204m, 423f
ASPD Callous–Unemotional	ns	M+	M+	Drislane et al. (2014)—US—271m, 347f
	ns	L+	M+	Sellbom & Phillips (2013)—US—204m, 423f
ASPD Narcissism	ns	M+	M+	Drislane et al. (2014)—US—271m, 347f
	S+	L+	M+	Sellbom & Phillips (2013)—US—204m, 423f

#### TABLE 10.4. (continued)

(continued)

#### Bold Criteria Mean Dis Studies, sample type, and size ASPD Impulsivity M+ L+ Drislane et al. (2014)-US-271m, 347f ns S+ M+ L+ Sellbom & Phillips (2013)-US-204m, 423f DSM-5 Antisocial PD M+ M+ Wall et al. (2015)—AO—152m ns M+ M+ Anderson et al. (2014)-US-252m, 211f ns DSM-5 Section III ASPD M+ L+ L+ Anderson et al. (2014)—CA—83m, 65f ns L+ L+ Anderson et al. (2014)-US-252m, 211f DSM-5 Section III Psychopathy L+ S-Anderson et al. (2014)—CA—83m, 65f ns Specifier M+ ns S+Anderson et al. (2014)-US-252m, 211f S-Crego & Widiger (2014)—CA—178m, 299f L+ ns Personality measures Neuroticism/Negative M-M+ Drislane et al. (2014)-US-271m, 347f ns Emotionality/Negative M-M+ Stanley et al. (2013)—AO—93m, 48f ns ns/S+M+/L+Poy et al. (2014)-US-96m, 253f Affectivity/Trait Anxiety M-/L-M-S+ M+ Strickland et al. (2013)—CA—90m, 98f M-S+ M+ Crego & Widiger (2014)—CA—178m, 299f Extraversion/Sociability/(low) L+ S+ Drislane et al. (2014)-US-271m, 347f ns Detachment M+ ns ns Stanley et al. (2013)—AO—93m, 48f Poy et al. (2014)—US—96m, 253f M+/L+ns/M+ ns/M+ M+ M-L+ Strickland et al. (2013)—CA—90m, 98f M+ Crego & Widiger (2014)—CA—178m, 299f ns ns Agreeableness/(low) M-L-Patrick (2010a)—AO—148m ns S-M-Drislane et al. (2014)-US-271m, 347f Antagonism L– S-L– M-Stanley et al. (2013)—AO—93m, 48f S-/M-S-/M-Poy et al. (2014)-US-96m, 253f M-S-L-Strickland et al. (2013)—CA—90m, 98f L-M-/Lns/M-L-Anderson et al. (2014)—CA—83m, 65f ns/S-M-/L-M-Anderson et al. (2014)-US-252m, 211f S-M-Crego & Widiger (2014)—CA—178m, 299f L– Conscientiousness/Control/ M-M-Drislane et al. (2014)-US-271m, 347f ns (low) Disinhibition S+ M-M-Stanley et al. (2013)—AO—93m, 48f ns/S+ S-/M-M-/L-Poy et al. (2014)-US-96m, 253f L– Strickland et al. (2013)—CA—90m, 98f S-M-S+ M-L-Crego & Widiger (2014)—CA—178m, 299f Stanley et al. (2013)—AO—93m, 48f S+M-S-Openness S+/M+ Poy et al. (2014)-US-96m, 253f ns ns S+Crego & Widiger (2014)—CA—178m, 299f ns ns Psychoticism M+ M+ Strickland et al. (2013)—CA—90m, 98f ns Machiavellianism S-L+ Sellbom & Phillips (2013)—AO—209f M+ L+ M+ S+ Sellbom & Phillips (2013)—AO—209f Narcissism/Grandiosity L+ M+ Stanley et al. (2013)—AO—93m, 48f ns M+ M+ S+ Anderson et al. (2014)-CA-83m, 65f S+S+ S+ Anderson et al. (2014)-US-252m, 211f

(continued)

#### TABLE 10.4. (continued)

238

Criteria	Bold	Mean	Dis	Studies, sample type, and size
Impulsivity/Sensation Seeking	S+ S+ ns	M+ L+ M+	M+ L+ L+	Sellbom & Phillips (2013)—AO—209f Anderson et al. (2014)—CA—83m, 65f Anderson et al. (2014)—US—252m, 211f
Empathy scales	S-/M-	M-/L-	ns/S–	Stanley et al. (2013)—AO—93m, 48f
Aggression/Hostility	ns ns ns	L+ L+ M+	M+ M+ S+	Drislane et al. (2014)—US—271m, 347f Anderson et al. (2014)—CA—83m, 65f Anderson et al. (2014)—US—252m, 211f
Thrill-Adventure Seeking/ Harm Avoidance/Behavioral Inhibition	M+ M+/L+ L+ M+	S+ S+/M+ L+ S+	S+ ns/ns M+ S+	Drislane et al. (2014)—US—271m, 347f Sellbom & Phillips (2013)—AO—209f Anderson et al. (2014)—CA—83m, 65f Anderson et al. (2014)—US—252m, 211f
Instrumental Risk Taking	S+	S+	ns	Rogers, Viding, & Chamorro-Premuzic (2013)— CA—718m, 366f
Disinhibited Risk Taking	ns	S+	S+	Rogers et al. (2013)—CA—718m, 366f
Other variables				
Anxious attachment style	M-	S+	M+	Craig et al. (2013)—US—61m, 153f
Avoidant attachment style	S-	S+	ns	Craig et al. (2013)—US—61m, 153f
Heroic acts	S+	ns	ns	Smith et al. (2013)—CA—173m, 284f
Altruistic acts	S+	S-	S-	Smith et al. (2013)—CA—173m, 284f

#### TABLE 10.4. (continued)

Note. Bold, Boldness; Mean, Meanness; Dis, Disinhibition; *ns*, not significant; S, small effect size; M, moderate effect size; L, large effect size; "+" and "-" indicate the direction of the effect; PCL, Psychopathy Checklist; PPI, Psychopathic Personality Inventory; LSRP, Levenson Self-Report Psychopathy scale; SRP-4, Hare Self-Report Psychopathy Scale-4; YPI, Youth Psychopathic Traits Inventory; NEO-PI-R, Revised NEO Personality Inventory; APSD, Antisocial Process Screening Device—Youth Version; US, university sample; CA, community adult sample; AO, adult offender sample; m, males; f, females. Values separated by a slash (/) reflect the range of effects across samples.

& Lynam, 2012), the findings reviewed here support its position as differentiating a well-accepted model of psychopathy (PCL-R) from ASPD, which was less evident at the level of Meanness and Disinhibition (Venables, Hall, & Patrick, 2014; Wall, Wygant, & Sellbom, 2015). Of course, given the relative recency of the TriPM, additional research is necessary to elaborate on its construct validity and clinical utility. For instance, these domain scores need to be linked to neuroscience constructs that are theoretically associated with them. In addition, given the relevance of psychopathy to forensic decision making and prediction, the TriPM will need to be incorporated into risk assessment paradigms as well.

#### **Elemental Psychopathy Assessment**

#### Construction

The EPA, a 178-item self-report inventory developed by Lynam and colleagues (2011) to assess psychopathy in terms of basic dispositional elements, is based on the FFM. Its items are organized into scales that assess maladaptive variants of the 18 FFM traits found to be most strongly related to psychopathy across a range of datasets (i.e., empirical correlations between FFM and psychopathy measures, expert ratings of psychopathy from the FFM perspective, and translations of items from psychopathy instruments [e.g., the PCL-R] into FFM language). The EPA yields a total score, four factor scores, 18 subscale scores, and two validity scale scores. Scores can be interpreted at either the broad-factor or subscale level.

Few and colleagues (2013) examined the factor structure of the 18 EPA subscales. Results across two university samples (one of which was the EPA development sample) indicated a four-factor solution. EPA Factor 1 (Antagonism) was marked by EPA scales corresponding to facet traits from the FFM domain of Agreeableness (reversed). EPA Factor 2 (Emotional Stability) was demarcated by scales corresponding to traits from the FFM Neuroticism domain (also reversed). Scales reflecting maladaptive variants of FFM Conscientiousness facets, along with EPA scales such as Urgency and Thrill Seeking, loaded on EPA Factor 3 (Disinhibition). EPA Factor 4 (Narcissism) was defined by an assortment of EPA scales corresponding to traits from the FFM domains of Extraversion, Neuroticism (reversed), and Agreeableness (reversed) (e.g., Self-Assurance, Dominance, Self-Contentment, Arrogance). Intercorrelations among the four EPA factors within the derivation and crossvalidation samples, respectively, ranged from -.14 and -.15 (for Emotional Stability with Disinhibition) to .53 and .60 (for Antagonism with Disinhibition), with median r's of .31 and .28 in the two samples.

#### Psychometric Properties

Wilson and colleagues (2011) reported a coefficient alpha of .94 for EPA total scores in an undergraduate participant sample, and alphas ranging from .68 to .89 for the EPA facet scales, with only the Arrogance subscale showing a coefficient below the generally accepted standard of .70. In a separate community adult sample recruited in a manner designed to oversample psychopathic traits, Miller, Hyatt, Rausher, Maples, and Zeichner (2014) reported high internal consistencies for the EPA total score and four factor scores (alphas ranged from .88 to .95).

As with the other psychopathy measures, we have tabulated the findings for EPA total and factor score associations with extratest validity criteria (see Table 10.5); for the 18 EPA scales, we report ranges of effect size estimates within the factors on which these scales load. The EPA total score correlated with criterion measures in generally expected ways and often to impressive degrees. The EPA factor scores (or constituent subscales) also display a pattern of promising convergent and discriminant validity, with the Emotional Stability factor showing a similar pattern to other measures of the Boldness construct (see correlates for PPI-FD and TriPM Boldness in Tables 10.2 and 10.3, respectively).

Lynam and colleagues (2013) developed a short form of the EPA using IRT analysis. The shortform contains 72 items, with each scale consisting of four items. Factor analysis yielded an identical factor structure as for that of the full-length EPA. Scale loadings were generally consistent across both short and long forms. The most notable exception was the Arrogance scale, which loaded most highly on Antagonism on the short-form and most highly on Narcissism on the long-form. The average coefficient alpha was .74 for the short form, compared to an average alpha of .81 for the long form. The internal structure of the scales was generally similar across the two forms. Moreover, Lynam and colleagues reported that correlations among the four factors were nearly identical for both versions of the EPA. Examination of shortform and long-form total scores with external criteria (including SRP-4, LSRP, and PPI total and factor scores, PPI Coldheartedness, FFM traits, and externalizing behaviors) revealed very similar (.98 or higher) correlations across three samples (the derivation sample, second college sample, and prison sample). The overall range of correlations and median *r*'s were essentially identical across the two versions. At the subscale level, the average difference in correlations between subscale scores on the two forms and external criteria ranged from .02 to .09 in the derivation sample, .02 to .08 in the second college sample, and .03 to .11 in the prison sample. Overall, Lynam and colleagues' efforts in developing a short form of comparable psychometric properties as its original form appear successful; of course, further validation research is necessary.

#### Summary

The EPA is the most recent installment of self-report psychopathy inventories. It is grounded in the FFM framework, which can serve as a structure for not only psychopathy but also personality-related psychopathology more broadly. Initial validation research, conducted at the time of this writing entirely by the authors of the instrument, appears promising. EPA scale scores are linked to their FFM counterparts, the EPA facet scales can be reduced to a psychologically intuitive higher-order structure, and the pattern of associations with extant psychopathy measures are generally in accord with

Criteria	Total	ANT	ES	DIS	NAR	Studies, sample type, and size
Psychopathy measure	s					
LSRP Total	L+ L+	M+/L+ M+/L+	ns/S– ns	M+/L+ M+	ns/L+ ns/M+	Lynam et al. (2011)—AO—70m Lynam at al. (2011)—US—408m, 499f Wilson et al. (2011)—US—66m, 50f
LSRP Primary/ Egocentricity/ Callous	L+ L+	M+/L+ M+/L+ L+	ns ns/S+ ns	ns/M+ S+/L+ M+	ns/M+ ns/M+ S+/M+	Lynam et al. (2011)—AO—70m Wilson et al. (2011)—US—66m, 50f Lynam at al. (2011)—US—408m, 499f Few et al. (2013)—US—417m, 370f
LSRP Secondary/ Antisocial	L+ M+	ns/S+ M+ L+	ns/M- ns/M- S-	M+/L+ M+/L+ L+	ns/M+ M-/L+ S+	Lynam et al. (2011)—AO—70m Wilson et al. (2011)—US—66m, 50f Lynam at al. (2011)—US—408m, 499f Few et al. (2013)—US—417m, 370f
SRP-4 Total	L+	Ľ+	Ns	L+	Ľ+	Miller, Hyatt, et al. (2014)—
	L+ L+	M+/L+ M+/L+ M+/L+	ns ns/M+ ns/M+	ns/L+ S+/L+ ns/L+	ns/L+ ns/M+ ns/M+	Lynam et al. (2011)—AO—70m Lynam at al. (2011)—US—408m, 499f Wilson et al. (2011)—US—66m, 50f
SRP-4 Total (Informant Rating)	L+	M+	ns	M+	M+	Miller, Hyatt, et al. (2014)— CA—76m, 30f
SRP-4 Interpersonal Manipulation	L+	L+ L+	ns ns	L+ M+	M+ M+	Few et al. (2013)—US—417m, 370f Miller, Hyatt, et al. (2014)—
	L+ L+	M+/L+ ns/L+ M+/L+	ns ns ns/S+	ns/L+ ns/M+ S+/M+	ns/L+ ns/M+ ns/M+	Lynam et al. (2011)—AO—70m Wilson et al. (2011)—US—66m, 50f Lynam at al. (2011)—US—408m, 499f
SRP-4 Interpersonal Manipulation (Informant Rating)	M+	M+	ns	M+	ns	Miller, Hyatt, et al. (2014)— CA—76m, 30f
SRP-4 Callous Affect	L+ L+	L+ L+	ns S+	M+ M+	M+ M+	Few et al. (2013)—US—417m, 370f Miller, Hyatt, et al. (2014)— CA—76m, 30f
	L+	M+/L+ ns/L+ M+/L+	ns ns/M+ ns/M+	ns/L+ ns/M+ ns/M+	ns/L+ ns/S+ ns/M+	Lynam et al. (2011)—AO—70m Wilson et al. (2011)—US—66m, 50f Lynam at al. (2011)—US—408m, 499f
SRP-4 Callous Affect (Informant Rating)	M+	L+	ns	ns	M+	Miller, Hyatt, et al. (2014)— CA—76m, 30f
SRP-4 Erratic Lifestyle	L+ L+	L+ L+	ns ns	L+ L+	M+ M+	Few et al. (2013)—US—417m, 370f Miller, Hyatt, et al. (2014)—
	L+	M+/L+ ns/M+ S+/M+	ns ns/M+	ns/L+ ns/L+ M+/L+	ns/L+ ns/S+ ns/M+	Lynam et al. (2011)—AO—70m Wilson et al. (2011)—US—66m, 50f Lynam at al. (2011)—US—408m, 499f (continued)

# TABLE 10.5. Effect Size Estimates for EPA Total and Factor Scales with Extratest Criterion Variables

Criteria	Total	ANT	ES	DIS	NAR	Studies, sample type, and size
SRP-4 Erratic Lifestyle (Informant Rating)	M+	ns	ns	M+	ns	Miller, Hyatt, et al. (2014)— CA—76m, 30f
SRP-4 Criminal Tendencies	L+	L+ L+	ns ns	M+ M+	S+ M+	Few et al. (2013)—US—417m, 370f Miller, Hyatt, et al. (2014)— CA—76m, 30f
	L+ M+	ns/L+ ns/M+ M+/L+	ns ns	ns/L+ ns/M+ S+/L+	ns/L+ ns ns/M+	Lynam et al. (2011)—AO—70m Wilson et al. (2011)—US—66m, 50f Lynam at al. (2011)—US—408m, 499f
SRP-4 Criminal Tendencies (Informant Rating)	M+	M+	ns	M+	ns	Miller, Hyatt, et al. (2014)— CA—76m, 30f
PPI-R Total	L+ L+	S+/L+ ns/L+	ns/M+ ns/L+	S+/L+ ns/L+	M+ ns/M+	Lynam et al. (2011)—AO—70m Lynam at al. (2011)—US—408m, 4991 Wilson et al. (2011)—US—66m, 50f
PPI-R Fearless Dominance	L+ L+	ns ns/M+ S–/S+	L+ M+/L+ S+/L+	S+ ns/L+ M–/M+	M+ ns/L+ ns/L+	Few et al. (2013)—US—417m, 370f Wilson et al. (2011)—US—66m, 50f Lynam et al. (2011)—AO—70m
PPI-R Self-Centered Impulsivity	L+ L+	L+ ns/L+ ns/L+	S– ns M–/S+	L+ M+/L+ S+/L+	M+ ns/M+ M+/L+	Few et al. (2013)—US—417m, 370f Wilson et al. (2011)—US—66m, 50f Lynam et al. (2011)—AO—70m
PPI-R Coldheartedness	L+	L+ M+/L+ ns/L+	S+ ns/M+ S+	M+ ns/M+ ns/M+	M+ ns ns/S+	Few et al. (2013)—US—417m, 370f Wilson et al. (2011)—US—66m, 50f Lynam et al. (2011)—AO—70m
Personality measures						
Paranoid PD	M+	ns/L+	ns/M–	ns/M+	ns/L+	Miller, Jones, & Lynam (2011)— US—84m, 136f
Schizoid PD	ns	ns/M+	ns	ns	ns	Miller, Jones, & Lynam et (2011)— US—84m, 136f
Schizotypal PD	ns	ns/M+	S-/M-	ns/S+	ns/S±	Miller, Jones, & Lynam (2011)— US—84m, 136f
Antisocial PD	M+	ns/M+	ns	S+/M+	ns/M+	Miller, Jones, & Lynam (2011)— US—84m, 136f
Borderline PD	S+	ns/M+	S-/L-	S+/L+	S-/M+	Miller, Jones, & Lynam (2011)— US—84m, 136f
Histrionic PD	S+	ns/S±	ns	ns/S+	S+/M+	Miller, Jones, & Lynam (2011)— US—84m, 136f
Narcissistic PD	M+	ns/M+	ns	ns/M+	ns/L+	Miller, Jones, & Lynam (2011)— US—84m, 136f

#### **TABLE 10.5.** (continued)

(continued)

	mucuj					
Criteria	Total	ANT	ES	DIS	NAR	Studies, sample type, and size
Avoidant PD	М-	ns/S+	M-	ns/S±	ns/L–	Miller, Jones, & Lynam (2011)— US—84m, 136f
Dependent PD	ns	ns	M-	ns/S+	ns/S–	Miller, Jones, & Lynam (2011)— US—84m, 136f
Obsessive– Compulsive PD	ns	ns/S+	ns/S–	ns/S+	ns/S+	Miller, Jones, & Lynam (2011)— US—84m, 136f
Neuroticism/ Emotionality (self,	Ns	ns/M+	ns/L–	ns/L+	M-/M+	Miller, Jones, & Lynam (2011)— US—84m, 136f
informant, thin slices)	ns/M–	ns/M-	M-/L-	ns	ns	Miller, Hyatt, et al. (2014)— CA—76m, 30f
Extraversion (self, informant, thin	ns/S–	ns/M-	ns/M+	ns/M-	Ns	Miller, Hyatt, et al. (2014)— CA—76m, 30f
slices)	ns	ns/M–	ns/M+	S-/S+	ns/L+	Miller, Jones, & Lynam (2011)— CA—76m, 30f
Agreeableness (self, informant, thin	M/L-	M-	ns/M+	M-/L-	M-	Miller, Hyatt, et al. (2014)— CA—76m, 30f
slices)	S-/L-	ns/L–	ns/S–	ns/L–	ns/L–	Miller, Jones, & Lynam (2011)— US—84m, 136f
Conscientiousness (self, informant,	ns/M– M–/S–	Ns	ns/S+	M-/L-	Ns	Miller, Hyatt, et al. (2014)— CA—76m, 30f
thin slices)	, , ,	ns/S–	S-/S+	S-/L-	S-/S+	Miller, Jones, & Lynam (2011)— US—84m, 136f
Openness (self, informant, thin	ns/S–	ns/M–	ns	ns	ns/M-	Miller, Hyatt, et al. (2014)— CA—76m, 30f
slices)	ns	ns/S–	ns	ns	ns/S+	Miller, Jones, & Lynam (2011)— US—84m, 136f
Honesty–Humility (self, informant)	M/L-	M-/L-	ns	ns/M–	M-	Miller, Hyatt, et al. (2014)— CA—76m, 30f
Narcissism–NPI Total	M+	M+	M+	Ns	L+	Miller, Hyatt, et al. (2014)— CA—76m, 30f
Total	L+	ns/M+	S+/M+	ns/M+	S+/L+	Miller, Jones, & Lynam (2011)— US—84m, 136f
Machiavellianism– Mach-20	L+	L+	ns	M+	M+	Miller, Hyatt, et al. (2014)— CA—76m, 30f
Behavioral variables						
Substance use		S+	Ns	M+	S+	Few et al. (2013)—US—417m, 370f
	S+	ns	ns	S+	ns	Miller, Hyatt, et al. (2014)— CA—76m, 30f
	ns S+	ns ns	ns ns	ns/M+ ns/M+	ns ns	Lynam et al. (2011)—AO—70m Wilson et al. (2011)—US—66m, 50f

#### TABLE 10.5. (continued)

(continued)

Criteria	Total	ANT	ES	DIS	NAR	Studies, sample type, and size
Alcohol use	M+ M+	ns/M+ ns/S+	Ns ns	ns/M+ ns/M+	ns/M+ ns	Lynam et al. (2011)—AO—70m Wilson et al. (2011)—US—66m, 50f
Antisocial behavior	L+	M+ M+	Ns ns	M+ M+	S+ M+	Few et al. (2013)—US—417m, 370f Miller, Hyatt, et al. (2014)— CA—76m_30f
	M+ M+	ns/M+ ns/M+	ns ns	ns/L+ ns/M+	ns/M+ ns/S+	Lynam et al. (2011)—AO—70m Wilson et al. (2011)—US—66m, 50f
Disciplinary infractions	M+	ns/M+	ns	ns/M+	ns/M+	Lynam et al. (2011)—AO—70m
Gambling		M+	S+	S+	S+	Few et al. (2013)—US—417m, 370f
Self-reported violent antisocial behavior	L+	M+	ns	M+	M+	Miller, Rausher, et al. (2014)— CA—74m, 30f
Self-reported nonviolent antisocial behavior	M+	M+	ns	M+	S+	Miller, Rausher, et al. (2014)— CA—74m, 30f
Self-reported	L+	L+	Ns	M+	M+	Miller, Rausher, et al. (2014)— CA—74m 30f
proactive aggression	M+	ns/M+	ns	S+/M+	ns/M+	Wilson et al. (2011)—US—66m, 50f
Self-reported	L+	M+	Ns	L+	L+	Miller, Rausher, et al. (2014)— CA—74m, 30f
	S+	ns/S+	ns/S–	ns/M+	ns/M+	Wilson et al. (2011)—US—66m, 50f
Aggression	L+	L+	ns	L+	L+	Miller, Rausher, et al. (2014)— CA—74m, 30f
Laboratory tasks						
Pressure	S+	S+	S+	ns	S+	Miller, Rausher, et al. (2014)— CA—74m, 30f
Cold pressor	ns	ns	ns	ns	ns	Miller, Rausher, et al. (2014)— CA—74m, 30f
Electric stimulation	S+	ns	ns	ns	ns	Miller, Rausher, et al. (2014)— CA—74m, 30f
Social cognition	M-/L-	ns/L–	ns/S–	ns/L–	ns/L–	Miller, Jones, & Lynam (2011)— US—84m, 136f

#### TABLE 10.5. (continued)

*Note.* ANT, antagonism; ES, emotional stability; DIS, disinhibition; NAR, narcissism; *ns*, not significant; S, small effect size; M, moderate effect size; L, large effect size; "+" and "-" indicate the direction of the effect; "±" indicates that some subscales within the higher-order domain were negatively correlated with this criterion, whereas others were positively correlated with it; PPI-R, Psychopathic Personality Inventory—Revised; LSRP, Levenson Self-Report Psychopathy scale; SRP-4, Hare Self-Report Psychopathy Scale-4; PD, personality disorder; US, university sample; CA, community adult sample; AO, adult offender sample; m, males; f, females. Values separated by a slash (/) reflect the range of effects across samples.

expectations. Unlike the LSRP and SRP-4, the EPA also provides for substantial coverage of Boldness or Fearless-Dominance, which we (although the EPA authors themselves admittedly disagree; see, e.g., Lynam & Miller, 2015) believe to be an important psychopathy domain (e.g., Lilienfeld et al., 2012; Chapter 8, this volume). Moreover, EPA scores are associated with a range of externalizing behaviors, mostly in expected manners. No study has yet examined the associations between EPA scale scores and clinician ratings of psychopathy (e.g., PCL-R), which many scholars still regarderroneously, in our view-as a "gold standard" assessment of psychopathy. It will be important to determine the degree to which core affective-interpersonal psychopathy traits as assessed by the PCL instruments can be captured by EPA scores. Furthermore, additional focus on the EPA's associations with laboratory tasks indexing the "litany of deficits" (Lynam & Miller, 2015), such as in affective and cognitive processing, and linking them to constituent EPA personality domains will be important. Finally, in the applied arena, much of the utility of the psychopathy construct comes with regard to risk assessment and other criminal justice-related outcomes; although cross-sectional and retrospective associations between externalizing behavior and EPA scores have been documented, predictive validity studies are lacking.

#### Indexing Psychopathic Personality Traits via Proxy Measures

A growing literature has focused on operationalizing and studying distinct facets of psychopathy through means of proxy measures computed by aggregating subscale or item scores from general personality or psychopathology inventories. The general rationale for this strategy has been that psychopathy is a construct (or "open concept"; see Meehl, 1986) that, although operationalized by specific measures designed to map onto particular notions of what it entails, can be indexed by any set of rationally or empirically selected items that provide sufficient content coverage. In our view, investigation of psychopathy from differing conceptual perspectives using alternatives operationalizations is important, as it provides an avenue for examining this clinical-personological construct in uniquely interesting and informative contexts-such as existing large-scale twin datasets (e.g., Blonigen, Hicks, Krueger, Patrick, & Iacono, 2006), samples of people from distinct walks of life (e.g., Lilienfeld et al., 2012), or even other-species samples (e.g., Latzman et al., 2016).

#### Psychopathic Personality Inventory

Scores on the PPI's two broad factors, FD and SCI (or Impulsive Antisociality; IA), have been indexed using data from two widely used inventories in particular, in multiple published studies. Benning and colleagues (2005) used regression equations from their earlier (Benning et al., 2003) article on PPI factor structure, predicting PPI factor scores from the 11 primary trait scales of the MPQ, to operationalize PPI-FD and PPI-IA for purposes of construct validation work in three distinct participant samples (university students, community adolescents, and incarcerated offenders). Benning and colleagues reported evidence for convergent and discriminant validity of these MPQ-estimated PPI factor scores in relation to questionnaire and interview-based criterion measures in these samples. For instance, estimated PPI-FD scores were correlated positively with narcissism and negatively with social anxiety measures, whereas estimated PPI-IA scores were associated selectively with alcohol and drug problems, as well as with child and adult antisocial symptoms. In subsequent work using university student participants, Witt, Donnellan, and Blonigen (2009a) provided support for the validity of MPO *item-based* operationalizations of PPI-FD and PPI-IA, and showed that these PPI constructs could also be indexed effectively using items from two other general personality inventories (International Personality Item Pool-Neuroticism, Extraversion and Openness inventory; Johnson, 2000; HEXACO [Honesty-Humility, Emotionality, eXtraversion, Agreeableness, Conscientiousness, and Openness] Personality Inventory; Lee & Ashton, 2004).

Other work by Benning and colleagues (2005) examined relative performance of MPQ-estimated PPI-FD and PPI-IA in predicting startle blink modulation and skin conductance reactivity when viewing positively and negatively valenced pictures in a subset of community participants from the Minnesota twin study sample. Consistent with findings for Factor 1 of the PCL-R in offender samples (Patrick, 1994; Vaidyanathan, Hall, Patrick, & Bernat, 2011), PPI-FD was selectively associated with attenuated fear-potentiated startle and decreased skin conductance response when viewing aversive pictures. In other work, Blonigen and colleagues (2006) undertook a longitudinal analysis of MPQ-estimated PPI-FD and PPI-IA scores, using data for a larger portion of this twin registry sample. These authors found evidence for individual and mean stability of PPI-FD scores, whereas scores on PPI-IA were found to decline over time. A substantial genetic contribution was evident for observed stability of scores on the two PPI factors, whereas nonshared environmental effects accounted for more of the variance in score differences across time. In other, related research using MPQ-based estimates of PPI-FD and PPI-IA, Witt, Donnellan, Blonigen, Krueger, and Conger (2009b) showed that scores on the two were strongly correlated with their PPI-R counterparts, exhibited good rank-order stability, and maintained expected associations with internalizing and externalizing psychopathology, respectively, over a 9-year interval.

Sellbom and colleagues (2012) developed similar estimates of PPI factor scores using MMPI-2-RF scales. Following the approach of Benning and colleagues (2005), they used conceptually relevant MMPI-2-RF scale scores to predict scores on the two PPI factors (via regression modeling) in large university and male offender samples. Phillips and colleagues (2014) developed parallel regressionbased score estimates for female offenders. In both the Sellbom and colleagues and Phillips and colleagues studies, MMPI-2-RF-estimated scores on the two PPI factors exhibited compelling convergent and discriminant relations with other psychopathy measures, including moderate to large associations with the PCL-SV in a forensic sample, with psychopathy-relevant personality traits (e.g., empathy, narcissism, Machiavellianism), and with clinician ratings of a range of internalizing and externalizing symptoms and traits.

In subsequent research, Rock and colleagues (2013) examined associations for MMPI-2-RFestimated PPI factor scores with treatment outcome and post-treatment recidivism in 483 male offenders court-ordered to undergo domestic violence treatment. While PPI-IA (but not PPI-FD) showed predictive associations with both clinical outcomes variables, PPI-FD moderated the relationship for PPI-IA with treatment outcome. Specifically, those high on both PPI factors were exponentially more likely to fail treatment. Focusing on risky sexual behavior as a clinical criterion, Kastner and Sellbom (2012) found unique predictive associations for both PPI-FD and PPI-IA in a large university sample, even when controlling for general impulsivity and sensation seeking, and in addition found a moderating impact of PPI-FD on the relationship between PPI-IA and risky sexual behavior, such that elevated scores on both factors were exponentially associated with higher scores on the risky sexual behavior measure.

#### Triarchic Psychopathy Model

Another recent line of research has used items from differing psychopathy measures (e.g., PPI/ PPI-R, Youth Psychopathic Traits Inventory [YPI; Andershed et al., 2002]) and omnibus personality inventories (e.g., MPQ, MMPI-2-RF) to index the three facet constructs of the triarchic psychopathy model (boldness, meanness, and disinhibition), based on a three-step procedure. First, personnel familiar with the triarchic model independently rate items from the source inventory for their conceptual relevance to each of the triarchic constructs. Next, the provisional scales are refined through internal psychometric analyses to optimize item specificity (i.e., selective convergence with targeted scale) and maximizing internal consistency. In the final validation step, the resultant triarchic scales are evaluated for convergent and discriminant relations with other psychopathy inventories and personality measures. Hall and colleagues (2014) documented an initial effort of this kind utilizing items from the PPI in large undergraduate and offender samples. The resultant PPI Boldness scale was associated selectively with TriPM Boldness, with MPQ personality traits of Social Potency, Stress Immunity, and Fearlessness, and with scores on the Interpersonal facet of the PCL-R. PPI Meanness was associated most strongly with the Meanness subscale of the TriPM, and with subscales of the LSRP and SRP-4 indexing Callousness, Egocentricity, Affective Detachment, and Antisocial Behavior; it also showed robust associations with personality traits reflecting detachment, antagonism, and aggression, and with symptoms of ASPD. Finally, scores on PPI Disinhibition were associated most strongly with psychopathy subscales indexing Impulsivity, Sensation Seeking, and Antisocial Tendencies. PPI Disinhibition also showed associations with MPQ traits of Aggression, Alienation, and Stress Reactivity, and child and adult symptoms of ASPD. Sellbom, Wygant, and Drislane (2015) replicated many of these findings, including those with TriPM and PCL-R psychopathy scores, in male prison inmate and community samples.

Drislane and colleagues (2015) used a similar procedure to develop triarchic facet (Tri) scales for the YPI, using data from a large university sample. These authors reported that the YPI Tri scores evinced good internal consistency, and promising convergent and discriminant validity in relation to factor scores on other psychopathy inventories. YPI Boldness showed strong associations with counterpart Boldness scales of the TriPM and PPI, and with scores on the PPI's FD factor. YPI Meanness showed expected robust associations with Meanness scales of the TriPM and PPI, the PPI Coldheartedness scale, SRP-4 Callous Affect and Interpersonal Manipulation, other measures of callous-unemotional traits, and subscales of the Childhood Psychopathy Measure (CPS; Lynam, 1997) reflecting lack of guilt and poverty of affect. Also in line with expectation, YPI Disinhibition showed robust convergence with Disinhibition scales of the TriPM and PPI, the PPI IA factor, the SRP-4 Erratic Lifestyle and LSRP Secondary scales, and subscales of the CPS reflecting impulsive-antisocial tendencies. However, some lack of expected discriminant validity was evident for the YPI Boldness scale in particular: It correlated more strongly with both the YPI Disinhibition Meanness scales than seen with other operationalizations (e.g., TriPM, PPI), and showed more-thanexpected associations with impulsive-antisocial subscales of the SRP-4 and CPS. These findings for the YPI Boldness scale, which likely reflect the generally correlated nature of the YPI's items, suggest that the item content of certain inventories may constrain the effectiveness of triarchic facet measures derivable from them (Drislane & Patrick, 2017; Patrick & Drislane, 2015). More recently, triarchic scales have also been developed for the MPQ (Brislin, Drislane, Smith, Edens, & Patrick, 2015) and MMPI-2-RF (Sellbom et al., 2016); the findings from these studies are quite similar to those reported for the PPI/PPI-R and YPI, though the MMPI-2-RF Meanness scale need further validation with respect to how well the instrument's items can capture the Coldheartedness/Callousness variance germane to this construct.

#### Summary

By and large, diverse efforts to estimate psychopathy both from the PPI and the triarchic psychopathy models have proven to be promising. As noted earlier, any measure (e.g., self-report, other-report, clinician rating) constitutes merely one operationalization of a construct. It therefore stands to reason that any item pool with sufficient content coverage of a construct from a particular theoretical perspective could be used to index the construct, although (as highlighted by the potential weaknesses of the YPI Boldness scale [Drislane et al., 2015] and the MMPI-2-RF Meanness scale [Sellbom et al., 2016]) caution is warranted, and demonstrations of convergent and discriminant validity are essential, before assuming that a derived measure effectively indexes the intended construct. Latent variables from confirmatory– structural models of target constructs, specified using existing validated scale indicators, can serve as useful referents for evaluating the equivalency of new scale measures (Drislane & Patrick, 2017).

In summary, findings from studies as described earlier indicate that omnibus measures of personality and psychopathology can be used to index the two factors of the PPI in a valid manner, and that some omnibus personality measures and psychopathy inventories can serve as sources of items for indexing the distinct constructs of the triarchic model. Future research should continue to evaluate these strategies, especially given the potential benefits they hold for advancing psychopathy research in valuable ways through use of unique existing samples and datasets.

#### **Conclusions and Future Directions**

The past two decades have witnessed significant advances in the self-report assessment of psychopathy. Previous pessimistic conclusions regarding the low correlations among self-report psychopathy measures (e.g., Hundleby & Ross, 1977; Hare, 1985) must now be revised in light of new evidence. It seems likely that these earlier conclusions were largely a consequence of the suboptimal content validity of many widely used "psychopathy" measures, including the MMPI Pd scale and CPI So scale, as few of these measures provided adequate coverage of features of psychopathy as described by Cleckley (1941/1988), Hare (1991/2003), and other influential scholars. The convergent associations among contemporary self-report measures such as the PPI/PPI-R, LSRP, TriPM, SRP-II/SRP-4, and EPA have proven considerably more promising than those of earlier measures, as have their convergent relations with measures of normal-range personality traits and other psychopathy-relevant personality and cognitive processes. Indeed, most published factor analyses of a range of self-report psychopathy subscales show a clear three-factor pattern, with high factor loadings indicating high convergence. Several measures load on a factor that can be viewed as akin to Meanness in the triarchic model, or interpersonal antagonism from more general trait theory (e.g., LSRP Egocentricity and Callousness, TriPM Meanness; PPI Coldheartedness); a second factor is typically reflective of Disinhibition (e.g., LSRP Antisocial, PPI-R Carefree Nonplanfulness, TriPM Disinhibition); and still other measures reflect a third Boldness or Fearless-Dominance factor (e.g., TriPM Boldness, PPI Social Potency and Fearlessness: see Marion et al., 2013; Seibert et al., 2011; Sellbom & Phillips, 2013).

In addition, several of these measures also correlate moderately with Factor 1 of the PCL-R (e.g., PPI: see Poythress, Edens, & Lilienfeld, 1998; Sellbom et al., 2012; TriPM: see Patrick, 2010b; Venables et al., 2014), appear to be situated in similar nomological networks as this PCL factor (e.g., PPI: see Poythress et al., 2010), and differentiate PCL-R psychopathy from DSM-defined ASPD (e.g., TriPM: see Venables et al., 2014; Wall et al., 2015), suggesting that at least some self-report psychopathy measures adequately assess what many consider to be the "core" interpersonal and affective features of psychopathy (Lilienfeld, 1994). Hence, once widespread claims that self-report measures are intrinsically unsuited for the assessment of psychopathy are difficult to sustain in light of this evidence.

At the same time, the past 20 years of research on self-report assessment of psychopathy has raised significant questions concerning (1) the potential limitations of self-report measures in the assessment of psychopathy and (2) the nature of the psychopathy construct itself. We address each of these questions in turn.

#### Potential Limitations of Self-Report Psychopathy Measures

Given the well-known propensity toward dissimulation among those high in psychopathy, it seems clear that self-report measures should rarely, if ever, be used in isolation to assess psychopathy in clinical settings (see Shadish, Cook, & Campbell, 2001, for a discussion of "monomethod bias"). In such settings, self-report measures should typically be supplemented with corroborative information, including file data and observer ratings. Presumably, such corroborative information can often provide incremental validity above and beyond self-reports, especially in settings in which the motivation to create either a positive or negative impression on questionnaires is high. Moreover, some measures with embedded validity scales (e.g., PPI- R; EPA) might prove particularly useful for these reasons, especially once these scales have been sufficiently validated.

Nevertheless, there is surprisingly little research bearing on the question of whether clinician rating assessments (e.g., PCL-R) confer incremental validity above and beyond self-reports in the assessment of psychopathy. In the only published study (to our knowledge) to address this issue,<sup>3</sup> Edens, Poythress, and Lilienfeld (1999) found that both the PPI and PCL-R correlated significantly with disciplinary infractions among inmates, although neither measure afforded significant incremental validity over the other for this quasi-criterion. This finding suggests that the PPI and PCL-R may tap largely overlapping (and thus redundant) regions of the criterion space, at least as far as institutional misbehavior is concerned. Nevertheless, the low correlations of both measures with institutional infractions (most r's were in the .20–.30 range) render this study a less than optimal test of incremental validity. In evaluating future research on the incremental validity of self-report measures above and beyond clinician rating measures, and vice versa, investigators will need to give careful consideration to the issue of criterion contamination. For example, we would expect the PPI to exhibit incremental validity above and beyond the PCL-R for self-report measures of antisocial behavior, and vice versa for file-based measures of antisocial behavior (given previously cited work by Blonigen et al., 2010). If so, these findings could be difficult to interpret, as they may reflect merely a largely tautological association between measures that assess overlapping content.

In addition, it has now been tentatively documented that self- and informant reports possess some significant overlap and similar accuracy in terms of psychopathy ratings (Miller, Jones, & Lynam, 2011; see also Jones & Miller, 2012). The overlap is not perfect, and if further studies have documented incremental validity of psychopathy self- and informant ratings, researchers should bear in mind both the hidden and blind quadrants of the Johari window, described earlier (Luft, 1969). In the hidden quadrant of this framework (see Figure 10.1), self-reports may be especially useful for detecting ego-dystonic affective traits common in psychopaths, such as chronic feelings of alienation, frustration, and boredom. In contrast, in the blind quadrant, observer reports may be especially useful for detecting ego-syntonic affective traits common in psychopaths, such as chronic feelings of ethical superiority, contempt toward others, or shallow affect. Such traits may be important "blind spots" (Grove & Tellegen, 1991) that are readily missed by self-report measures of psychopathy.

Observer reports may also provide incremental validity in detecting the absence of certain longstanding emotional dispositions, such as guilt, warmth, love, and empathy. After all, it may be inherently paradoxical to ask psychopathic individuals to report on the absence of emotions they have rarely, if ever, experienced. Because individuals high in psychopathy presumably possess absent or poorly developed personal construct systems for guilt and similar emotions, they may be understandably bewildered by others' reactions to their callous behaviors. Psychopathic individuals' lack of personal construct systems for such emotions may explain their striking "absence of insight" (Cleckley, 1941/1988). Observers, in contrast, may accurately infer the absence of such emotions from certain highly diagnostic behaviors, such as cruel behaviors toward people or animals or a chronic lack of fidelity in romantic relationships. If so, observer reports may exhibit especially marked incremental validity above and beyond self-reports for the "cold" and "calculating" behaviors traditionally viewed as prototypical for psychopathy.

This reasoning may partly explain why research has established that certain self-reported psychopathy traits, such as coldheartedness, do not load well with other psychopathy indicators in factor analyses (see, e.g., for PPI: Benning et al., 2003; for SRP-II: Lester et al., 2013), and callous–unemotional traits (in childhood) and Meanness (in adulthood) emerge as distinct subdimensions of psychopathy. In turn, this is consistent with the broader personality literature indicating that affective detachment is a separate dimension from other traits (Depue & Morrone-Strupinsky, 2005).

Still, we should not reflexively assume that the modest or negligible correlations observed for most self-report psychopathy measures with PCL-R Factor 1 represent a shortcoming of the former rather than the latter. Indeed, it is equally plausible that neither the interview component of the PCL-Rwhich is, after all, scored on the basis of self-report combined with clinical judgment-nor the file component of the PCL-R adequately assesses the absence of guilt and other interpersonal emotions (see Hall, Benning, & Patrick, 2004, for evidence that in contrast to the "interpersonal" and "behavioral" factors derived from a three-factor solution of the PCL-R, the "affective factor" of the PCL-R correlates minimally with variables in the domains of personality, intelligence, and adaptive functioning). It would be premature to exclude the hypothesis that certain self-report measures of psychopathy actually provide better measures of such interpersonal emotions than does the PCL-R, in part because they contain many questions assessing these traits and thereby capitalize on the Spearman-Brown formula (see Epstein, 1979, for a discussion of the principle of aggregation in personality assessment). An important direction for future research will be to compare the incremental validity of PCL-R Factor 1 and self-report instruments, such as the TriPM Meanness domain scale, in predicting performance on laboratory tasks that ostensibly tap psychopaths' affective deficits, such as lexical decision-making tasks using emotional and nonemotional words or the fear-potentiated startle paradigm (e.g., Lorenz & Newman, 2002; Patrick, 1994; Williamson, Harpur, & Hare, 1991).

#### The Nature of the Psychopathy Construct

The available literature clearly indicates that all self-report psychopathy measures have at least two higher-order factors, with most measures reviewed here containing three or four-which in some cases are weakly or partially intercorrelated (e.g., PPI FD, Boldness, EPA Emotional Stability) rather than uniformly and appreciably interrelated. The interview-based PCL-R also includes separable factors, further divisible into facets (Hare, Neumann, & Mokros, Chapter 3, this volume) that show strongly divergent associations with criterion measures in self-report, clinical-diagnostic, behavioral, and physiological response domains. The extensive data indicating that psychopathy assessed in various ways entails separable facets with contrasting correlates points to a need for reconceptualization of the psychopathy construct itself (Skeem et al., 2011). Rather than a classical syndrome, which, as noted earlier, comprises a constellation of covarying signs and symptoms (Kazdin, 1983), psychopathy may instead be a maladaptive configuration of largely independent dimensions. Along this line, Patrick (2006) suggested that the observed features of psychopathy may reflect the operation of two distinguishable mechanisms, or "processes"—one involving reduced fear reactivity or threat sensitivity, and the other, the other frontal lobes executive dysfunction (see also Patrick & Bernat, 2009; Patrick & Drislane, 2015). However, the presence of at least three distinct dispositional facets to psychopathy, as posited by the triarchic model, may call for a *triple-process* theory. In addition to weak threat sensitivity and impaired executive control as mechanisms for boldness and disinhibition, respectively, a separate process entailing weak affiliation/attachment capacity and deficient empathy may be required to account for the meanness facet (Moul, Killcross, & Dadds, 2012; Patrick et al., 2009).

The multiprocess view of psychopathy is consistent with interpersonal models of personality, which imply that certain traits, which need not be positively correlated, combine to produce configurations associated with malignant interpersonal consequences.<sup>4</sup> For example, passivity and aggressiveness are generally viewed as separate dimensions in interpersonal models of personality (Wiggins, 1982). However, when the two occur together, they combine to create a potent-and highly noxious-interpersonal style (i.e., passiveaggressive personality) that cannot be predicted from either dimension alone. In the case of psychopathy, individuals who are both guiltless and callous on the one hand and risk taking and irresponsible on the other may be especially notable for their untrustworthiness in interpersonal interactions (Lilienfeld et al., Chapter 8, this volume).

This alternative view of psychopathy as a configural condition may call for alternative models of scoring and interpreting self-report psychopathy measures. Scholars may need to consider configural (multiplicative or interactive) models of scoring self-report psychopathy measures instead of, or at least in addition to, more traditional linear (additive) models that rely on merely summing scores on lower-order psychopathy dimensions. Although configural models of personality assessment have rarely fared well in head-to-head comparisons with linear models (e.g., Goldberg, 1965), most of these models have been exploratory and largely devoid of a compelling theoretical rationale. The situation may be different in the case of psychopathy because the conceptualization of this construct as a compound trait accords well with the rich literature on interpersonal models of personality and personality disorders.

Of course, possible constellations of three (PPI, TriPM, LSRP) or even four (EPA, SRP-II, SRP-4) psychopathy domains can yield multiple and quite differing manifestations of "psychopathy," which leads to the logical question of how the construct should be defined. For example, high boldness coupled with high disinhibition yields a different phenotype than high meanness coupled with high disinhibition. This concern is obviously not new, as the field has grappled with this broader definitional issue for a long time (see, e.g., Lilienfeld, 1994), with no satisfactory resolution. Are particular domains more important than others? Does one particular domain always need to be elevated? Do all domains need to be elevated?

A compelling argument can perhaps be made for the essentiality of meanness or antagonism in differing manifestations of psychopathy (Lynam, Miller, & Derefinko, Chapter 11, this volume; see also Crego & Widiger, 2015; Lynam & Miller, 2015). However, there is evidence that the boldness domain, which maps onto many of the features of psychopathy described by Cleckley (1976; see Lilienfeld et al., Chapter 8, and Patrick, Chapter 1, this volume), differentiates psychopathy from DSM ASPD (Venables et al., 2014; Wall et al., 2015), and consistently distinguishes primary from secondary psychopathy in subtype studies (Hicks & Drislane, Chapter 13, this volume). We might therefore need to at least entertain the possibility that there is not one "core" to psychopathy, but that there exists a "family" of overlapping trait constellations that are variously recognizable as psychopathy (see Haslam & Ernst, 2002, for a discussion of the "family resemblance" construct as applied to variants of psychopathology).

#### **Concluding Thoughts**

To paraphrase Mark Twain, early rumors of the death of self-report measures of psychopathy have been greatly exaggerated. Research from the past two decades demonstrates that the self-report assessment of psychopathy is alive and well. At the same time, the often perplexing literature we have reviewed continues to raise important questions. Nonetheless, there is ample reason to be optimistic because these unresolved questions may suggest answers to more fundamental questions regarding the conceptualization and etiology of psychopathy.

#### ACKNOWLEDGMENT

We thank Yiyun Shou for her assistance with the literature review.

#### NOTES

 The formal name of this scale was unclear until very recently. In a personal communication, a Multi-Health Systems psychologist involved with SRP-III research (Kevin Williams, March 16, 2011) advised us to call it Hare Self-Report Psychopathy Scale (Hare SRP; see also Jones & Paulhus, 2010), which was subsequently used in Neal and Sellbom (2012); however, in subsequent e-mail correspondence, Delroy Paulhus (August 24, 2011) stated a preference for SRP-III. It is typically being referred to as SRP-III in the literature, but recent studies (e.g., Seara-Cardoso, Dolberg, Neumann, Roiser, & Viding, 2013) have referred to it as SRP-4, particularly in reference to a 28-item short form. The formal manual, which was published at the copyedit stage of this chapter, has labeled it SRP-4. In this chapter, we now use SRP-4 to be consistent with the formal name of the scale, which somewhat awkwardly bypasses SRP-III.

- Given the voluminous literature on the PPI/PPI-R relative to other measures covered in this chapter, we elected to summarize exemplary findings in a narrative and instead tabulate common findings from the two meta-analyses (Marcus, Fulton, & Edens, 2013; Miller & Lynam, 2012).
- 3. In a more recent study, Jones and Miller (2012) did find that self- and informant reports of psychopathy (using the LSRP, PPI-R, and NEO-PI-R) evinced mutual incremental validity in the assessment of externalizing behaviors in a community sample; however, this study was cross-sectional and did not use a clinician rating instrument.
- 4. Lynam and Miller (2015) posited a similar argument in which the constellation of multiple personality domain elevations that constitutes the psychopathic personality can serve to explain the "litany of deficits" associated with the condition, if each deficit is assumed to relate to a specific trait domain (e.g., reduced threat sensitivity with reversed Neuroticism, prefrontal deficits with reversed Conscientiousness).

#### REFERENCES

- Alliger, G. M., Lilienfeld, S. O., & Mitchell, K. E. (1996). The susceptibility of overt and covert integrity tests to coaching and faking. *Psychological Science*, 7(1), 32–39.
- Allport, G. (1961). Pattern and growth in personality. New York: Holt, Reinhart & Winston.
- American Psychiatric Association. (1980). Diagnostic and statistical manual of mental disorders (3rd ed.). Washington, DC: Author.
- American Psychiatric Association. (1987). Diagnostic and statistical manual of mental disorders (3rd ed., rev.). Washington, DC: Author.
- Andershed, H., Kerr, M., Stattin, H., & Levander, S. (2002). Psychopathic traits in non-referred youths: Initial test of a new assessment tool. In E. Blaauw, J. M. Philippa, K. C. M. P. Ferenschild, & B. van Lodensteijn (Eds.), Psychopaths: Current international perspectives (pp. 131–158). The Hague: Elsevier.
- Anderson, J. L., Sellbom, M., Wygant, D. B., & Edens, J. F. (2013). Examining the necessity for and utility of the Psychopathic Personality Inventory—Revised

(PPI-R) Validity Scales. Law and Human Behavior, 37, 312–320.

- Anderson, J. L., Sellbom, M., Wygant, D. B., Salekin, R. T., & Krueger, R. F. (2014). Examining the associations between DSM-5 Section III antisocial personality disorder traits and psychopathy in community and university samples. *Journal of Personality Disorders*, 28, 675–697.
- Benning, S. D., Patrick, C. J., Hicks, B. M., Blonigen, D. M., & Krueger, R. F. (2003). Factor structure of the Psychopathic Personality Inventory: Validity and implications for clinical assessment. *Psychological As*sessment, 15, 340–350.
- Benning, S. D., Patrick, C. J., & Iacono, W. G. (2005). Psychopathy, startle blink modulation, and electrodermal reactivity in twin men. *Psychophysiology*, 42(6), 753–762.
- Ben-Porath, Y. S. (2013). Self-report inventories: Assessing personality and psychopathology. In J. R. Graham & J. A. Naglieri (Eds.), Assessment psychology (pp. 622–644). New York: Wiley.
- Ben-Porath, Y. S., & Tellegen, A. (2008). MMPI-2-RF: Manual for administration, scoring and interpretation. Minneapolis: University of Minnesota Press.
- Blackburn, R., & Fawcett, D. (1999). The Antisocial Personality Questionnaire: An inventory for assessing personality deviation in offender populations. *European Journal of Psychological Assessment*, 15, 14–24.
- Block, J. (1965). The challenge of response sets. New York: Appleton-Century-Crofts.
- Blonigen, D. M., Hicks, B. M., Krueger, R. F., Patrick, C. J., & Iacono, W. G. (2006). Continuity and change in psychopathic traits as measured via normal-range personality: A longitudinal-biometric study. *Journal* of Abnormal Psychology, 115, 85–95.
- Blonigen, D. M., Patrick, C. J., Douglas, K. S., Poythress, N. G., Skeem, J. L., Lilienfeld, S. O., et al. (2010). Multimethod assessment of psychopathy in relation to factors of internalizing and externalizing from the Personality Assessment Inventory: The impact of method variance and suppressor effects. *Psychological Assessment*, 22(1), 96–107.
- Book, A. S., Holden, R. R., Starzyk, K. B., Wasylkiw, L., & Edwards, M. J. (2006). Psychopathic traits and experimentally induced deception in self-report assessment. *Personality and Individual Differences*, 41, 601–608.
- Brinkley, C. A., Diamond, P. M., Magaletta, P. R., & Heigel, C. P. (2008). Cross-validation of Levenson's Psychopathy Scale in a sample of federal female inmates. Assessment, 15, 464–482.
- Brinkley, C. A., Schmitt, W. A., Smith, S. S., & Newman, J. P. (2001). Construct validation of a self-report psychopathy scale: Does Levenson's self-report psychopathy scale measure the same constructs as Hare's Psychopathy Checklist—Revised? Personality and Individual Differences, 31, 1021–1038.
- Brislin, S. J., Drislane, L. E., Smith, S. T., Edens, J. F.,

& Patrick, C. J. (2015). Development and validation of triarchic psychopathy scales from the Multidimensional Personality Questionnaire. *Psychological Assessment*, 27(3), 838–851.

- Buss, A. H., & Perry, M. (1992). The Aggression Questionnaire. Journal of Personality and Social Psychology, 63, 452–459.
- Butcher, J. N., Graham, J. R., Ben-Porath, Y. S., Tellegen, A., Dahlstrom, W. G., & Kaemmer, B. (2001). Minnesota Multiphasic Personality Inventory–2: Manual for administration and scoring (rev. ed.). Minneapolis: University of Minnesota Press.
- Butcher, J. N., Graham, J. R., Williams, C. L., & Ben-Porath, Y. (1990). Development and use of the MMPI-2 content scales. Minneapolis: University of Minnesota Press.
- Campbell, M. A., Doucette, N. L., & French, S. (2009). Validity and stability of the Youth Psychopathic Traits Inventory in a nonforensic sample of young adults. *Journal of Personality Assessment*, 91(6), 584– 592.
- Carré, J. M., Hyde, L. W., Neumann, C. S., Viding, E., & Hariri, A. R. (2013). The neural signatures of distinct psychopathic traits. *Social Neuroscience*, 8(2), 122–135.
- Chapman, A. L., Gremore, T. M., & Farmer, R. F. (2003). Psychometric analysis of the Psychopathic Personality Inventory (PPI) with female inmates. *Journal of Personality Assessment*, 80, 164–172.
- Christian, E., & Sellbom, M. (2016). Development and validation of an expanded version of the three-factor Levenson Self Report Psychopathy Scale. *Journal of Personality Assessment*, 98, 155–168.
- Cleckley, H. (1988). The mask of sanity. St. Louis, MO: Mosby. (Original work published 1941)
- Craig, R. L., Gray, N. S., & Snowden, R. J. (2013). Recalled parental bonding, current attachment, and the triarchic conceptualisation of psychopathy. *Personality and Individual Differences*, 55(4), 345–350.
- Crego, C., & Widiger, T. A. (2014). Psychopathy, DSM-5, and a caution. Personality Disorders: Theory, Research, and Treatment, 5(4), 335–347.
- Crego, C., & Widiger, T. A. (2015). Psychopathy and the DSM. Journal of Personality, 83, 665–677.
- Debowska, A., Boduszek, D., Kola, S., & Hyland, P. (2014). A bifactor model of the Polish version of the Hare Self-Report Psychopathy Scale. *Personality and Individual Differences*, 69, 231–237.
- Depue, R. A., & Morrone-Strupinsky, J. V. (2005). A neurobehavioral model of affiliative bonding: Implications for conceptualizing a human trait of affiliation. Behavioral and Brain Sciences, 28, 313–349.
- Douglas, K. S., Lilienfeld, S. O., Skeem, J. L., Poythress, N. G., Edens, J. F., & Patrick, C. J. (2008). Relation of antisocial and psychopathic traits to suicide-related behavior among offenders. *Law and Human Behavior*, 32, 511–525.
- Drislane, L. E., Brislin, S. J., Kendler, K. S., Andershed, H., Larsson, H., & Patrick, C. J. (2015). A triarchic

model analysis of the Youth Psychopathic Traits Inventory. Journal of Personality Disorders, 29, 15–41.

- Drislane, L. E., & Patrick, C. J. (2017). Integrating alternative conceptions of psychopathic personality: A latent variable model of triarchic psychopathy constructs. *Journal of Personality Disorders*, 31(1), 110–132.
- Drislane, L. E., Patrick, C. J., & Arsal, G. (2014). Clarifying the content coverage of differing psychopathy inventories through reference to the Triarchic Psychopathy Measure. *Psychological Assessment*, 26, 350–362.
- Edelmann, R. J., & Vivian, S. E. (1988). Further analysis of the social psychopathy scale. *Personality and Indi*vidual Differences, 9, 581–587.
- Edens, J. F., Buffington, J. K., & Tomicic, T. L. (2000). An investigation of the relationship between psychopathic traits and malingering on the Psychopathic Personality Inventory. Assessment, 7, 281–296.
- Edens, J. F., Hart, S. D., Johnson, D. W., Johnson, J. K., & Olver, M. E. (2000). Use of the personality assessment inventory to assess psychopathy in offender populations. *Psychological Assessment*, 12, 132–139.
- Edens, J. F., Poythress, N. G., & Lilienfeld, S. O. (1999). Identifying inmates at risk for disciplinary infractions: A comparison of two measures of psychopathy. *Behavioral Sciences and the Law*, 17, 435–443.
- Edens, J. F., Poythress, N. G., Lilienfeld, S. O., & Patrick, C. J. (2008). A prospective comparison of two measures of psychopathy in the prediction of institutional misconduct. *Behavioral Sciences and the Law*, 26(5), 529–541.
- Ekman, P. (1985). Telling lies. New York: Norton.
- Epstein, S. (1979). The stability of behavior: I. On predicting more of the people more of the time. *Journal* of Personality and Social Psychology, 37, 1097–1126.
- Eysenck, H. J., & Eysenck, S. B. G. (1964). Manual of the Eysenck Personality Inventory. London: University of London Press.
- Eysenck, S. B. G., & Eysenck, H. J. (1975). Manual of the Eysenck Personality Questionnaire. London: University of London Press.
- Few, L. R., Miller, J. D., & Lynam, D. R. (2013). An examination of the factor structure of the Elemental Psychopathy Assessment. Personality Disorders: Theory, Research, and Treatment, 4(3), 247–253.
- Finney, J. C. (1985). Anxiety: Its measurement by objective personality tests and self-report. In A. H. Tuma & J. D. Maser (Eds.), Anxiety and the anxiety disorders (pp. 645–673). Hillsdale, NJ: Erlbaum.
- Fite, P. J., Raine, A., Stouthamer-Loeber, M., Loeber, R., & Pardini, D. A. (2010). Reactive and proactive aggression in adolescent males: Examining differential outcomes 10 years later in early adulthood. Criminal Justice and Behavior, 37, 141–157.
- Fowler, K. A., & Lilienfeld, S. O. (2007). The Psychopathy Q-Sort Construct Validity Evidence in a Nonclinical Sample. Assessment, 14, 75–79.
- Goldberg, L. R. (1965). Diagnosticians vs. diagnostic

signs: The diagnosis of psychosis vs. neurosis from the MMPI. *Psychological Monographs*, 79(9, Whole No. 602), 29.

- Gordon, H. L., Baird, A. A., & End, A. (2004). Functional differences among those high and low on a trait measure of psychopathy. *Biological Psychiatry*, 56, 516–521.
- Gough, H. G. (1960). Theory and method of socialization. Journal of Consulting and Clinical Psychology, 24, 23–30.
- Graham, J. R. (2012). MMPI-2: Assessing personality and psychopathology (5th ed.). New York: Oxford University Press.
- Grove, W. M., & Tellegen, A. (1991). Problems in the classification of personality disorders. *Journal of Per*sonality Disorders, 5, 31–42.
- Gynther, M. D., Altman, H., & Warbin, R. W. (1973). Behavioral correlates for the Minnesota Multiphasic Personality Inventory 4–9, 9–4 code types: A case of the emperor's new clothes? *Journal of Consulting and Clinical Psychology*, 40, 259–263.
- Haertzen, C. A., Martin, W. R., Ross, F. E., & Neidert, G. L. (1980). Psychopathic States Inventory (PSI): Development of a short test for measuring psychopathic states. *International Journal of the Addictions*, 15, 137–146.
- Hall, J. R., Benning, S. D., & Patrick, C. J. (2004). Criterion-related validity of the three-factor model of psychopathy: Personality, behavior, and adaptive functioning. Assessment, 11, 4–16.
- Hall, J. R., Drislane, L. E., Patrick, C. J., Morano, M., Lilienfeld, S. O., et al. (2014). Development and validation of the triarchic construct scales from the Psychopathic Personality Inventory. *Psychological As*sessment, 26, 447–461.
- Hare, R. D. (1980). A research scale for the assessment of psychopathy in criminal populations. *Personality* and Individual Differences, 1(2), 111–119.
- Hare, R. D. (1982). Psychopathy and the personality dimensions of Psychoticism, Extraversion, and Neuroticism. Personality and Individual Differences, 3, 35–42.
- Hare, R. D. (1985). A comparison of procedures for the assessment of psychopathy. *Journal of Consulting and Clinical Psychology*, 53, 7–16.
- Hare, R. D. (1993). Without conscience: The disturbing world of the psychopaths among us. New York: Pocket Books.
- Hare, R. D. (2003). The Hare Psychopathy Checklist— Revised. Toronto: Multi-Health Systems. (Original work published 1991)
- Hare, R. D., & Cox, D. N. (1978). Clinical and empirical conceptions of psychopathy, and the selection of subjects for research. In R. D. Hare & D. Schalling (Eds.), *Psychopathic behaviour: Approaches to research* (pp. 1–21). Chichester, UK: Wiley.
- Hare, R. D., Hemphill, J. F., & Harpur, T. J. (1989). Scoring pamphlet for the Self-Report Psychopathy Scale: SRP-II. Unpublished manuscript, University of British Columbia, Vancouver, Canada.

- Harpur, T. J., Hare, R. D., & Hakstian, A. R. (1989). Two-factor conceptualization of psychopathy: Construct validity and assessment implications. *Psychological Assessment*, 1, 6–17.
- Hart, S. D., Cox, D. N., & Hare, R. D. (1995). Manual for the Psychopathy Checklist: Screening Version (PCL:SV). Toronto: Multi-Health Systems.
- Hart, S. D., Forth, A. E., & Hare, R. D. (1991). The MCMI-II and psychopathy. *Journal of Personality Dis*orders, 5, 318–327.
- Hart, S. D., & Hare, R. D. (1994). Psychopathy and the Big Five: Correlations between observers' ratings of normal and pathological personality. *Journal of Per*sonality Disorders, 8, 32–40.
- Hart, S. D., Hare, R. D., & Harpur, T. J. (1992). The Psychopathy Checklist: Overview for researchers and clinicians. In J. Rosen & P. McReynolds (Eds.), Advances in psychological assessment (Vol. 7, pp. 103– 130). New York: Plenum Press.
- Haslam, N., & Ernst, D. (2002). Essentialist beliefs about mental disorders. Journal of Social and Clinical Psychology, 21, 628–644.
- Hathaway, S. R., & McKinley, J. C. (1940). A Multiphasic Personality Schedule (Minnesota): I. Construction of the schedule. *Journal of Psychology*, 10, 249–254.
- Hawk, S. S., & Peterson, R. A. (1973). Do MMPI psychopathic deviancy scores reflect psychopathic deviancy or just deviancy? *Journal of Personality Assessment*, 38, 362–368.
- Haynes, S. N., Richard, D. C. S., & Kubany, E. S. (1995). Content validity in psychological assessment: A functional approach to concepts and methods. *Psychological Assessment*, 7, 238–247.
- Hundleby, J. D., & Ross, B. E. (1977). A comparison of questionnaire measures of psychopathy. *Journal of Consulting and Clinical Psychology*, 45, 702–703.
- John, O. P., & Srivastava, S. (1999). The big five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed., pp. 102–138). New York: Guilford Press.
- Johnson, J. A. (2000). Developing a short form of the IPIP-NEO: A report to HGW Consulting. Unpublished manuscript, Department of Psychology, University of Pennsylvania, DuBois, PA.
- Jonason, P. K., & Webster, G. D. (2010). The Dirty Dozen: A concise measure of the dark triad. Psychological Assessment, 22, 420–432.
- Jones, D. N., & Paulhus, D. L. (2010). Different provocations trigger aggression in narcissists and psychopaths. Social Psychological and Personality Science, 1(1), 12–18.
- Jones, S., & Miller, J. D. (2012). Psychopathic traits and externalizing behaviors: A comparison of self-and informant reports in the statistical prediction of externalizing behaviors. Psychological Assessment, 24, 255–260.
- Karpman, B. (1948). The myth of psychopathic personality. American Journal of Psychiatry, 103, 523–534.

- Kastner, R. M., & Sellbom, M. (2012). Hypersexuality in college students: The role of psychopathy. Personality and Individual Differences, 53, 644–649.
- Kastner, R. M., Sellbom, M., & Lilienfeld, S. O. (2012). A comparison of the psychometric properties of the Psychopathic Personality Inventory full-length and short-form versions. *Psychological Assessment*, 24, 261–267.
- Kazdin, A. E. (1983). Psychiatric diagnosis, dimensions of dysfunction, and child behavior therapy. *Behavior Therapy*, 14, 73–99.
- Kelly, G. (1955). The psychology of personal constructs (2 vols.). New York: Norton.
- Kendrick, D., & Funder, D. (1988). Profiting from controversy: Lessons from the person–situation debate. *American Psychologist*, 43, 23–34.
- Kosson, D. S., Steuerwald, B. L., Newman, J. P., & Widom, C. S. (1994). The relation between socialization and antisocial behavior, substance use, and family conflict in college students. *Journal of Personality Assessment*, 63, 473–488.
- Kramer, M. D., Patrick, C. J., Krueger, R. F., & Gasperi, M. (2012). Delineating physiologic defensive reactivity in the domain of self-report: Phenotypic and etiologic structure of dispositional fear. *Psychological Medicine*, 42, 1305–1320.
- Kroger, R. O., & Turnbull, W. (1975). Invalidity of validity scales: The case of the MMPI. *Journal of Consulting and Clinical Psychology*, 43, 48–55.
- Krueger, R. F., Hicks, B. M., Patrick, C. J., Carlson, S. R., Iacono, W. G., & McGue, M. (2002). Etiologic connections among substance dependence, antisocial behavior and personality: Modeling the externalizing spectrum. *Journal of Abnormal Psychology*, 111, 411–424.
- Krueger, R. F., Markon, K. E., Patrick, C. J., Benning, S. D., & Kramer, M. D. (2007). Linking antisocial behavior, substance use, and personality: An integrative quantitative model of the adult externalizing spectrum. *Journal of Abnormal Psychology*, 116, 645–666.
- Kucharski, L. T., Duncan, S., Egan, S. S., & Falkenbach, D. M. (2006). Psychopathy and malingering of psychiatric disorder in criminal defendants. *Behavioral Sciences and the Law*, 24, 633–644.
- Latzman, R. D., Drislane, L. E., Hecht, L. K., Brislin, S. J., Patrick, C. J., Lilienfeld, S. O., et al. (2016). A chimpanzee (*Pan troglodytes*) model of triarchic psychopathy constructs: Development and initial validation. *Clinical Psychological Science*, 4, 50–66.
- Lee, K., & Ashton, M. C. (2004). Psychometric properties of the HEXACO personality inventory. *Multi*variate Behavioral Research, 39, 329–358.
- Lester, W., Salekin, R. T., & Sellbom, M. (2013). The SRP-II as a rich source of data on the psychopathic personality. *Psychological Assessment*, 25, 32–46.
- Levenson, M. R., Kiehl, K. A., & Fitzpatrick, C. M. (1995). Assessing psychopathic attributes in a nonsinstitutionalized population. *Journal of Personality* and Social Psychology, 68(1), 151–158.

- Lilienfeld, S. O. (1990). Development and preliminary validation of a self-report measure of psychopathic personality. Unpublished doctoral dissertation, University of Minnesota, Minneapolis, MN.
- Lilienfeld, S. O. (1994). Conceptual problems in the assessment of psychopathy. Clinical Psychology Review, 14, 17–38.
- Lilienfeld, S. O. (1996). The MMPI-2 antisocial practices content scale: Construct validity and comparison with the psychopathic deviate scale. *Psychological Assessment*, 8, 281–293.
- Lilienfeld, S. O. (1998). Methodological advances and developments in the assessment of psychopathy. Behaviour Research and Therapy, 36, 99–125.
- Lilienfeld, S. O. (2013). Is psychopathy a syndrome?: Commentary on Marcus, Fulton, and Edens. Personality Disorders: Theory, Research, and Treatment, 4, 85–86.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment*, 66, 488–524.
- Lilienfeld, S. O., Patrick, C. J., Benning, S. D., Berg, J., Sellbom, M., & Edens, J. F. (2012). The role of fearless dominance in psychopathy: Confusions, controversies, and clarifications. *Personality Disorders: Theory, Research, and Treatment*, 3, 327–340.
- Lilienfeld, S. O., & Penna, S. (2001). Anxiety sensitivity: Relations to psychopathy, DSM-IV personality disorders, and personality traits. *Journal of Anxiety Disorders*, 15, 367–393.
- Lilienfeld, S. O., & Widows, M. (2005). Manual for the Psychopathic Personality Inventory—Revised (PPI-R). Lutz, FL: Psychological Assessment Resources.
- Lorenz, A., & Newman, J. P. (2002). Do emotion and information processing deficiencies found in Caucasian psychopaths generalize to African-American psychopaths? *Personality and Individual Differences*, 32, 1077–1086.
- Luft, J. (1969). Of human interaction. Palo Alto, CA: National Press.
- Lykken, D. T. (1957). A study of anxiety in the sociopathic personality. *Journal of Abnormal and Social Psychology*, 55, 6–10.
- Lykken, D. T. (1995). The antisocial personalities. Mahwah, NJ: Erlbaum.
- Lykken, D. T., Tellegen, A., & Katzenmeyer, C. (1973). Manual for the Activity Preference Questionnaire. Minneapolis: University of Minnesota Press.
- Lynam, D. R. (1997). Pursuing the psychopath: Capturing the fledgling psychopath in a nomological net. *Journal of Abnormal Psychology*, 106, 425–438.
- Lynam, D. R., Gaughan, E. T., Miller, J. D., Miller, D. J., Mullins-Sweatt, S., & Widiger, T. A. (2011). Assessing the basic traits associated with psychopathy: Development and validation of the Elemental Psychopathy Assessment. *Psychological Assessment, 23*, 108–124.
- Lynam, D. R., & Miller, J. D. (2012). Fearless dominance

and psychopathy: A response to Lilienfeld et al. Personality Disorders: Theory, Research, and Treatment, 3, 341–353.

- Lynam, D. R., & Miller, J. D. (2015). Psychopathy from a basic trait perspective: The utility of a five-factor model approach. *Journal of Personality*, 83, 611–626.
- Lynam, D. R., Sherman, E. D., Samuel, D., Miller, J. D., Few, L. R., & Widiger, T. (2013). Development of a short form of the Elemental Psychopathy Assessment. Assessment, 20, 659–669.
- Lynam, D. R., Whiteside, S., & Jones, S. (1999). Selfreported psychopathy: A validation study. *Journal of Personality Assessment*, 73, 110–132.
- MacNeil, B. M., & Holden, R. R. (2006). Psychopathy and the detection of faking on self-report inventories of personality. *Personality and Individual Differences*, 41, 641–651.
- Mahmut, M. K., Homewood, J., & Stevenson, R. J. (2008). The characteristics of non-criminals with high psychopathy traits: Are they similar to criminal psychopaths? *Journal of Research in Personality*, 42, 679–692.
- Mahmut, M. K., Menictas, C., Stevenson, R. J., & Homewood, J. (2011). Validating the factor structure of the Self-Report Psychopathy Scale in a community sample. *Psychological Assessment*, 23, 670–678.
- Malterer, M. B., Lilienfeld, S. O., Neumann, C. S., & Newman, J. P. (2009). Concurrent validity of the Psychopathic Personality Inventory with offender and community samples. Assessment, 7, 3–15.
- Marcus, D. K., Fulton, J. J., & Edens, J. F. (2013). The two-factor model of psychopathic personality: Evidence from the Psychopathic Personality Inventory. *Personality Disorders: Theory, Research, and Treatment*, 4, 67–76.
- Marcus, D. K., & Norris, A. L. (2014). A new measure of attitudes toward sexually predatory tactics and its relation to the triarchic model of psychopathy. *Journal* of Personality Disorders, 28, 247–261.
- Marion, B. E., Sellbom, M., Salekin, R. T., Toomey, J. A., Kucharski, L. T., & Duncan, S. (2013). An examination of the association between psychopathy and dissimulation using the MMPI-2-RF validity scales. *Law and Human Behavior*, 37, 219–230.
- McCord, W., & McCord, J. (1964). The psychopath: An essay on the criminal mind. Princeton, NJ: Van Nostrand.
- McHoskey, J. W., Worzel, W., & Szyarto, C. (1998). Machiavellianism and psychopathy. Journal of Personality and Social Psychology, 74, 192–210.
- Meehl, P. E. (1945). The dynamics of "structured" personality tests. Journal of Clinical Psychology, 1, 296– 303.
- Meehl, P. E. (1959). Some ruminations on the validation of clinical procedures. Canadian Journal of Psychology, 13, 102–128.
- Meehl, P. E. (1986). Diagnostic taxa as open concepts: Meta-theoretical and statistical questions about the reliability and construct validity in the grand strategy of nosological questions. In T. Millon & G. L.

Klerman (Eds.), Contemporary directions in psychopathology: Toward the DSM-IV (pp. 215–231). New York: Guilford Press.

- Miller, J. D., Gaughan, E. T., Maples, J., Gentile, B., Lynam, D. R., & Widiger, T. A. (2011). Examining the construct validity of the Elemental Psychopathy Assessment. Assessment, 18, 106–114.
- Miller, J. D., Hyatt, C. S., Rausher, S., Maples, J. L., & Zeichner, A. (2014). A test of the construct validity of the Elemental Psychopathy Assessment scores in a community sample of adults. *Psychological Assessment*, 26, 555–562.
- Miller, J. D., Jones, S. E., & Lynam, D. R. (2011). Psychopathic traits from the perspective of self and informant reports: Is there evidence for a lack of insight? *Journal of Abnormal Psychology*, 120, 758–764.
- Miller, J. D., & Lynam, D. R. (2012). An examination of the Psychopathic Personality Inventory's nomological network: A meta-analytic review. Personality Disorders: Theory, Research, and Treatment, 3, 305–326.
- Miller, J. D., Rausher, S., Hyatt, C. S., Maples, J., & Zeichner, A. (2014). Examining the relations among pain tolerance, psychopathic traits, and violent and nonviolent antisocial behavior. *Journal of Abnormal Psychology*, 123, 205–213.
- Millon, T. (1981). Disorders of personality, DSM-III: Axis II. New York: Wiley.
- Millon, T. (1987). Millon Clinical Multiaxial Inventory– II: Manual for the MCMI-II. Minneapolis, MN: National Computer Systems
- Morey, L. (2007). The Personality Assessment Inventory professional manual. Lutz, FL: Psychological Assessment Resources.
- Morey, L. C., Blashfield, R. K., Webb, W. W., & Jewell, J. (1988). MMPI scales for DSM-III personality disorders: A preliminary validation study. *Journal of Clinical Psychology*, 44, 47–50.
- Morgan, A. B. (2000). The relation of social information processing to psychopathic personality traits. Unpublished master's thesis, Emory University, Atlanta, GA.
- Moul, C., Killcross, S., & Dadds, M. R. (2012). A model of differential amygdala activation in psychopathy. *Psychological Review*, 119, 789–806.
- Neal, T. M. S., & Sellbom, M. (2012). Examining the factor structure of the Hare Self-Report Psychopathy Scale. Journal of Personality Assessment, 94, 244–253.
- Neumann, C. S., Malterer, M. B., & Newman, J. P. (2008). Factor structure of the Psychopathic Personality Inventory (PPI): Findings from a large incarcerated sample. *Psychological Assessment*, 20(2), 169–174.
- Patrick, C. J. (1994). Emotion and psychopathy: Startling new insights. Psychophysiology, 31, 319–330.
- Patrick, C. J. (2006). Getting to the heart of psychopathy. In H. Hervé & J. C. Yuille (Eds.), Psychopathy: Theory, research, and practice (pp. 207–252). Mahwah, NJ: Erlbaum.
- Patrick, C. J. (2010a). Conceptualizing the psychopathic personality: Disinhibited, bold, . . . or just plain

mean? In R. T. Salekin & D. R. Lynam (Eds.), Handbook of child and adolescent psychopathy (pp. 79–109). New York: Guilford Press.

- Patrick, C. J. (2010b). Operationalizing the triarchic conceptualization of psychopathy: Preliminary description of brief scales for assessment of boldness, meanness, and disinhibition. Unpublished test manual, Florida State University, Tallahassee, FL.
- Patrick, C. J., & Bernat, E. (2009). Neurobiology of psychopathy: A two-process theory. In G. G. Berntson & J. T. Cacioppo (Eds.), *Handbook of neuroscience for* the behavioral sciences (Vol. 2, pp. 1110–1131). New York: Wiley.
- Patrick, C. J., & Drislane, L. E. (2015). Triarchic model of psychopathy: Origins, operationalizations, and observed linkages with personality and general psychopathology. *Journal of Personality*, 83, 627–643.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. Development and Psychopathology, 21, 913–938.
- Paulhus, D. L. (1991). Measurement and control of response bias. In J. P. Robinson & P. R. Shaver (Eds.), Measures of personality and social psychological attitudes (pp. 17–59). San Diego, CA: Academic Press.
- Paulhus, D. L., Neumann, C. S., & Hare, R. D. (2017). SRP-4: Self-Report Psychopathy Scale—Fourth Edition. Toronto: Multi-Health Systems.
- Paulhus, D. L., & Williams, K. M. (2002). The dark triad of personality: Narcissism, Machiavellianism, and psychopathy. *Journal of Research in Personality*, 36, 556–563.
- Phillips, T. R., Sellbom, M., Ben-Porath, Y. S., & Patrick, C. J. (2014). Further development and construct validation of MMPI-2-RF indices of global psychopathy, fearless–dominance, and impulsive–antisociality in a sample of incarcerated women. *Law and Human Behavior*, 28, 34–46.
- Piedmont, R. L., McCrae, R. R., Riemann, R., & Angleitner, A. (2000). On the invalidity of validity scales: Evidence from self-reports and observer ratings in volunteer samples. *Journal of Personality and Social Psychology*, 78, 582–593.
- Poy, R., Segarra, P., Esteller, À., López, R., & Moltó, J. (2014). FFM description of the triarchic conceptualization of psychopathy in men and women. *Psychological Assessment*, 26, 69–76.
- Poythress, N. G., Edens, J. F., & Lilienfeld, S. O. (1998). Criterion-related validity of the Psychopathic Personality Inventory in a prison sample. *Psychological Assessment*, 10, 426–430.
- Poythress, N. G., Edens, J. F., & Watkins, M. M. (2001). The Relationship between psychopathic personality features and malingering symptoms of major mental illness. *Law and Human Behavior*, *25*, 567–582.
- Poythress, N. G., Lilienfeld, S. O., Skeem, J. L., Douglas, K. S., Edens, J. F., Epstein, M., et al. (2010). Using the PCL-R to help estimate the validity of two self-report measures of psychopathy with offenders. Assessment, 17, 206–219.

- Quay, H. C., & Parsons, L. B. (1971). The differential behavioral classification of the juvenile offender. Washington, DC: Bureau of Prisons, U.S. Department of Justice.
- Ray, J. V., Hall, J., Rivera-Hudson, N., Poythress, N. G., Lilienfeld, S. O., & Morano, M. (2013). The relation between self-reported psychopathic traits and distorted response styles: A meta-analytic review. *Personali*ty Disorders: Theory, Research, and Treatment, 4, 1–14.
- Robins, L. R. (1966). Deviant children grown up. Baltimore: Williams & Wilkins.
- Rock, R. C., Sellbom, M., Ben-Porath, Y. S., & Salekin, R. T. (2013). Concurrent and predictive validity of psychopathy in a batterers intervention sample. *Law* and Human Behavior, 37, 145–154.
- Rogers, J., Viding, E., & Chamorro-Premuzic, T. (2013). Instrumental and disinhibited financial risk taking: Personality and behavioural correlates. *Personality* and Individual Differences, 55(6), 645–649.
- Rogers, R., Bagby, R. M., & Dickens, S. E. (1992). Structured Interview of Reported Symptoms. Tampa, FL: Psychological Assessment Resources.
- Rogers, R., Vitacco, M. J., Jackson, R. L., Martin, M., Collins, M., & Sewell, K. W. (2002). Faking psychopathy: An examination of response styles with antisocial youth. *Journal of Personality Assessment*, 78, 31–46.
- Ross, S. R., Benning, S. D., Patrick, C. J., Thompson, A., & Thurston, A. (2009). Factors of the Psychopathic Personality Inventory: Criterion-related validity and relationship to the BIS/BAS and five-factor models of personality. Assessment, 16(1), 71–87.
- Salekin, R. T., Chen, D. R., Sellbom, M., Lester, W. S., & MacDougall, E. (2014). Examining the factor structure and convergent and discriminant validity of the Levenson Self-Report Psychopathy Scale. Personality Disorders: Theory, Research, and Treatment, 5, 289–304.
- Salekin, R. T., Trobst, K. K., & Krioukova, M. (2001). Construct validity of psychopathy in a community sample: A nomological net approach. *Journal of Per*sonality Disorders, 15, 425–441.
- Sandvik, A. M., Hansen, A. L., Kristensen, M. V., Johnsen, B. H., Logan, C., & Thornton, D. (2012). Assessment of psychopathy: Inter-correlations between Psychopathy Checklist Revised, Comprehensive Assessment of Psychopathic Personality–Institutional Rating Scale, and Self-Report of Psychopathy Scale– III. International Journal of Forensic Mental Health, 11, 280–288.
- Seara-Cardoso, A., Dolberg, H., Neumann, C., Roiser, J. P., & Viding, E. (2013). Empathy, morality and psychopathic traits in women. *Personality and Individual Differences*, 55, 328–333.
- Seara-Cardoso, A., Neumann, C., Roiser, J., McCrory, E., & Viding, E. (2012). Investigating associations between empathy, morality and psychopathic personality traits in the general population. *Personality and Individual Differences*, 52, 67–71.
- Sechrest, L. (1963). Incremental validity: A recommen-

dation. Educational and Psychological Measurement, 23, 153–158.

- Seibert, L. A., Miller, J. D., Few, L. R., Zeichner, A., & Lynam, D. R. (2011). An examination of the structure of self-report psychopathy measures and their relations with general traits and externalizing behaviors. Personality Disorders: Theory, Research, and Treatment, 2, 193–208.
- Sellbom, M. (2011). Elaborating on the construct validity of the Levenson Self-Report Psychopathy Scale in incarcerated and non-incarcerated samples. *Law and Human Behavior*, 35, 440–451.
- Sellbom, M. (2015). Elucidating the complex associations between psychopathy and post-traumatic stress disorder from the perspective of trait negative affectivity. International Journal of Forensic Mental Health, 14, 85–92.
- Sellbom, M., Ben-Porath, Y. S., Lilienfeld, S. O., Patrick, C. J., & Graham, J. R. (2005). Assessing psychopathic personality traits with the MMPI-2. *Journal of Personality Assessment*, 85, 334–343.
- Sellbom, M., Ben-Porath, Y. S., McNulty, J. L., Arbisi, P. A., & Graham, J. R. (2006). Elevation differences between MMPI-2 clinical and restructured clinical (RC) scales: Origins and interpretative implications. Assessment, 13, 430–441.
- Sellbom, M., Ben-Porath, Y. S., Patrick, C. J., Wygant, D. B., Gartland, D. M., & Stafford, K. P. (2012). Development and construct validation of MMPI-2-RF measures assessing global psychopathy, fearlessdominance, and impulsive-antisociality. *Personality Disorders: Theory, Research, and Treatment*, 3, 17–38.
- Sellbom, M., Ben-Porath, Y. S., & Stafford, K. S. (2007). A comparison of MMPI-2 measures of psychopathic deviance in a forensic setting. *Psychological Assessment*, 19, 430–436.
- Sellbom, M., Drislane, L. E., Johnson, A. K., Goodwin, B. E., Phillips, T. R., & Patrick, C. J. (2016). Development and validation of MMPI-2-RF scales for indexing triarchic psychopathy constructs. Assessment, 23, 527–543.
- Sellbom, M., & Phillips, T. R. (2013). An examination of the triarchic conceptualization of psychopathy in incarcerated and nonincarcerated samples. *Journal of Abnormal Psychology*, 122, 208–214.
- Sellbom, M., & Verona, E. (2007). Neuropsychological correlates of psychopathic traits in a non-incarcerated sample. *Journal of Research in Personality*, 41, 276–294.
- Sellbom, M., Wygant, D. B., & Drislane, L. E. (2015). Elucidating the construct validity of the Psychopathic Personality Inventory triarchic scales. *Journal of Personality Assessment*, 97, 374–381.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2001). Experimental and quasi-experimental designs for generalized causal inference. Boston: Houghton Mifflin.
- Shou, Y., Sellbom, M., & Han, J. (2016). Evaluating the construct validity of the Levenson Self-Report Psychopathy Scale in China. Assessment. [Epub ahead of print]

- Skeem, J. L., Polaschek, D., Patrick, C. J., & Lilienfeld, S. O. (2011). Psychopathic personality: Bridging the gap between empirical evidence and public policy. *Psychological Science in the Public Interest*, 12, 95–162.
- Smith, R. J. (1985). The concept and measurement of social psychopathy. *Journal of Research in Personality*, 19, 219–231.
- Smith, S. F., Lilienfeld, S. O., Coffey, K., & Dabbs, J. M. (2013). Are psychopaths and heroes twigs off the same branch?: Evidence from college, community, and presidential samples. *Journal of Research in Per*sonality, 47, 634–646.
- Somma, A., Fossati, A., Patrick, C. J., Maffei, C., & Borroni, S. (2014). The three-factor structure of the Levenson Self-Report Psychopathy Scale: Fool's gold or true gold?: A study in a sample of Italian adult nonclinical participants. *Personality and Mental Health*, 8, 337–347.
- Spielberger, C. D., Kling, J. K., & O'Hagan, S. E. (1978). Dimensions of psychopathic personality: Antisocial behavior and anxiety. In R. D. Hare & D. Schalling (Eds.), *Psychopathic behaviour: Approaches to research* (pp. 23–46). Chichester, UK: Wiley.
- Spitzer, R. L., Williams, J. B. W., & Gibbon, M. (1987). Structured clinical interview for DSM-III-R Axis II (SCID-II). Washington, DC: American Psychiatric Association Press.
- Stanley, J. H., Wygant, D. B., & Sellbom, M. (2013). Elaborating on the construct validity of the Triarchic Psychopathy Measure in a criminal offender sample. *Journal of Personality Assessment*, 95, 343–350.
- Stevens, D., Charman, T., & Blair, R. J. (2001). Recognition of emotion in facial expressions and vocal tones in children with psychopathic tendencies. *Journal of Genetic Psychology*, 162, 201–211.
- Strickland, C. M., Drislane, L. E., Lucy, M., Krueger, R. F., & Patrick, C. J. (2013). Characterizing psychopathy using DSM-5 personality traits. Assessment, 20, 323–338.
- Tellegen, A. (1982). Manual for the Multidimensional Personality Questionnaire. Unpublished manuscript, University of Minnesota. (Original work published 1978)
- Tellegen, A. (1985). Structure of mood and personality and their relevance to assessing anxiety, with an emphasis on self-report. In A. H. Tuma & J. D. Maser (Eds.), Anxiety and the anxiety disorders (pp. 681– 706). Hillsdale, NJ: Erlbaum.
- Tellegen, A., Ben-Porath, Y. S., McNulty, J. L., Arbisi, P. A., Graham, J. R., & Kaemmer, B. (2003). MMPI–2 restructured clinical (RC) scales: Development, validation, and interpretation. Minneapolis: University of Minnesota Press.
- Tellegen, A., & Waller, N. (2008). Exploring personality through test construction: Development of the Multidimensional Personality Questionnaire. In G. J. Boyle, G. Matthews, & D. H. Saklofske (Eds.), Handbook of personality theory and testing: Personality measurement and assessment (Vol. 2, pp. 261–292). Thousand Oaks, CA: SAGE.

- Tonnaer, F., Cima, M., Sijtsma, K., Uzieblo, K., & Lilienfeld, S. O. (2013). Screening for psychopathy: Validation of the Psychopathic Personality Inventory–Short Form with reference scores. Journal of Psychopathology and Behavioral Assessment, 35, 153–161.
- Vaidyanathan, U., Hall, J. R., Patrick, C. J., & Bernat, E. M. (2011). Clarifying the role of defensive reactivity deficits in psychopathy and antisocial personality using startle reflex methodology. *Journal of Abnormal Psychology*, 120, 253–258.
- Vaidyanathan, U., Patrick, C. J., & Bernat, E. M. (2009). Startle reflex potentiation during aversive picture viewing as an index of trait fear. *Psychophysi*ology, 46, 75–85.
- Venables, N. C., Hall, J. R., & Patrick, C. J. (2014). Differentiating psychopathy from antisocial personality disorder: A triarchic model perspective. *Psychological Medicine*, 44, 1005–1013.
- Venables, N. C., Sellbom, M., Sourander, A., Kendler, K., Joiner, T. E., Drislane, L. E., et al. (2015). Separate and interactive contributions of weak inhibitory control and threat sensitivity to prediction of suicide risk. *Psychiatry Research*, 226, 461–466.
- Vieira, J. B., & Marsh, A. A. (2014). Don't stand so close to me: Psychopathy and the regulation of interpersonal distance. Frontiers in Human Neuroscience, 7, 907.
- Vincent, N. M. P., Linsz, N. L., & Greene, M. I. (1966). The L scale of the MMPI as an index of falsification. *Journal of Clinical Psychology*, 22, 214–215.
- Visser, B. A., Ashton, M. C., & Pozzebon, J. A. (2012). Is low anxiety part of the psychopathy construct? *Journal of Personality*, 80, 725–747.
- Vitacco, M. J., Neumann, C. S., & Pardini, D. A. (2014). Predicting future criminal offending in a community-based sample of males using self-reported psychopathy. *Criminal Justice and Behavior*, 41, 345–363.
- Wall, T. D., Wygant, D. B., & Sellbom, M. (2015). Boldness explains a key difference between psychopathy and antisocial personality disorder. *Psychiatry*, *Psychology*, and Law, 22, 94–105.
- Watson, D., & Clark, L. A. (1984). Negative affectivity: The disposition to experience aversive emotional states. *Psychological Bulletin*, 96(3), 465–490.
- Watt, B. D., & Brooks, N. S. (2012). Self-report psychopathy in an Australian community sample. Psychiatry, Psychology and Law, 19, 389–401.
- Wheeler, S., Book, A., & Costello, K. (2009). Psychopathic traits and perceptions of victim vulnerability. *Criminal Justice and Behavior*, 36(6), 635–648.

- Widiger, T. A., Cadoret, R., Hare, R., Robins, L., Rutherford, M., Zanarini, M., et al. (1996). DSM-IV antisocial personality disorder field trial. *Journal of Abnormal Psychology*, 105, 3–16.
- Widom, C. S., & Newman, J. P. (1985). Characteristics of noninstitutionalized psychopaths. In J. Gunn & D. Farrington (Eds.), *Current research in forensic psychiatry and psychology* (Vol. 2, pp. 57–80). New York: Wiley.
- Wiggins, J. S. (1982). Circumplex models of interpersonal behavior in clinical psychology. In P. C. Kendall & J. M. Butcher (Eds.), *Handbook of research methods in clinical psychology* (pp. 183–221). New York: Wiley.
- Williams, K. M., Nathanson, C., & Paulhus, D. L. (2010). Identifying and profiling scholastic cheaters: Their personality, cognitive ability, and motivation. *Journal* of Experimental Psychology: Applied, 16, 293–307.
- Williams, K. M., Paulhus, D. L., & Hare, R. D. (2007). Capturing the four-factor structure of psychopathy in college students via self-report. *Journal of Personality Assessment*, 88, 205–219.
- Williamson, S. E., Harpur, T. J., & Hare, R. D. (1991). Abnormal processing of affective words by psychopaths. *Psychophysiology*, 28, 260–273.
- Wilson, L., Miller, J. D., Zeichner, A., Lynam, D. R., & Widiger, T. A. (2011). An examination of the validity of the Elemental Psychopathy Assessment: Relations with other psychopathy measures, aggression, and externalizing behaviors. Journal of Psychopathology and Behavioral Assessment, 33, 315–322.
- Witt, E. A., Donnellan, M. B., & Blonigen, D. M. (2009a). Using existing self-report inventories to measure the psychopathic personality traits of fearless dominance and impulsive antisociality. *Journal* of Research in Personality, 43, 1006–1016.
- Witt, E. A., Donnellan, M. B., Blonigen, D. M., Krueger, R. F., & Conger, R. D. (2009b). Assessment of fearless dominance and impulsive antisociality via normal personality measures: Convergent validity, criterion validity, and developmental change. *Journal of Per*sonality Assessment, 91, 265–276.
- Yancey, J. R., Venables, N. C., & Patrick, C. J. (2016). Psychoneurometric operationalization of threat sensitivity: Relations with clinical symptom and physiological response criteria. *Psychophysiology*, 53, 393–405.
- Zuckerman, M., Kolin, E. A., Price, L., & Zoob, I. (1964). Development of a sensation-seeking scale. *Journal of Consulting Psychology*, 28, 477–482.

### CHAPTER 11

# Psychopathy and Personality

An Articulation of the Benefits of a Trait-Based Approach

> DONALD R. LYNAM JOSHUA D. MILLER KAREN J. DEREFINKO

n 1937, Allport offered one of the first systematic definitions of personality: "Personality is the dynamic organization within the individual of those psychophysical systems that determine his unique adjustment to the environment" (1937, p. 48). Since that time, dozens of other similar definitions have appeared. Our preferred definition is a simple one: Personality refers to an individual's characteristic patterns of thinking, feeling, and acting. All these definitions share several features. First, personality is internal; it resides within the individual. Second, personality is manifested broadly; it has cognitive, affective, interpersonal, and behavioral components. Third, personality accounts for stable behavior patterns across time and situations. Using this definition, psychopathy can be understood as a particular personality pattern.

The idea of psychopathy as a personality configuration is not new. All seminal descriptions of psychopathy refer to personality traits. The two most influential descriptions, those of Cleckley and Hare, are saturated with personality. Although older descriptions exist, most modern accounts of psychopathy begin with Cleckley's (1941/1988) conceptualization, based on his work with inpatient psychiatric patients who appeared

on the surface to be psychologically intact but who manifested extreme impairment (e.g., hospitalizations; multiple arrests and incarcerations; unemployment; relational dysfunction). Across his case studies, Cleckley identified 16 characteristics of psychopathy, at least 10 of which can be considered personality traits: superficial charm and good "intelligence," absence of "nervousness," unreliability, untruthfulness and insincerity, lack of remorse or shame, poor judgment and failure to learn by experience, pathological egocentricity and incapacity for love, general poverty in major affective reactions, unresponsiveness in general interpersonal relations, and failure to follow any life plan. The remaining six criteria reference more specific behaviors or states, many of which are likely influenced by personality dispositions (e.g., inadequately motivated antisocial behavior, suicide rarely carried out, and sex life impersonal, trivial, and poorly integrated).

After Cleckley, Hare (1991, 2003) has made the most influential contributions to the conceptualization, assessment, and diagnosis of psychopathy. Beginning with and expanding on Cleckley's description, Hare's measure of psychopathy—the Hare Psychopathy Checklist—Revised (PCL-R; Hare, 2003)—assesses 20 constructs that group

into four first-order facets. The interpersonal facet includes the following traits/behaviors: glibness/ superficial charm, grandiose sense of self-worth, pathological lying, and conning/manipulative behavior. The affective facet includes lack of remorse or guilt, shallow affect, callousness/lack of empathy, and failure to accept responsibility for actions. The erratic lifestyle facet contains need for stimulation/proneness to boredom, parasitic lifestyle, lack of realistic long-term goals, impulsivity, and irresponsibility. The final antisocial behavior facet includes poor behavioral controls, early behavioral problems, juvenile delinquency, revocation of conditional release, and criminal versatility. Among all of these constructs, only four fail to directly reference personality-early behavioral problems, juvenile delinquency, revocation of conditional release, and criminal versatility.

Even among less well-known descriptions, personality looms large. The McCords (1964) described the psychopathic individual in their book, The Psychopath: An Essay on the Criminal Mind, using six primary descriptors, all of which reference personality traits: (1) asocial, (2) driven by uncontrolled desires, (3) highly impulsive, (4) aggressive, (5) feels little guilt, and (6) warped capacity for love. They wrote that the psychopath is "Narcissus, completely absorbed in himself, craving only his own pleasure" who "often seems willing to sacrifice everything for excitement" (p. 9). Interpersonally, the McCords described the psychopath as one who is "cold and compassionless," and who "treats people as he does objects: as means for his own pleasure," and they suggested that the "fleeting attachments" that the psychopath develops "lack emotional depth and tenderness" (p. 15). Similarly, Karpman (e.g., 1941, 1948) described (primary) psychopaths as being characterized by a complete lack of conscience and a "virtual absence of any redeeming social reactions: conscience, guilt, binding and generous emotions" (p. 533). Instead, these individuals manifested "a total inability to defer pleasure and sacrifice immediate gain" (p. 529), such that "purely egoistic, uninhibited instinctive trends are predominant" (p. 533).

#### **Structural Models of Personality**

Thus, psychopathy is, at its core, personality. More specifically, however, we argue that psychopathy is a particular personality configuration. To demonstrate this, we must be able to integrate different descriptions using a common terminology or lexicon. Several such lexicons are available in the form of structural models of personality that use multiple dimensions, domains, or superfactors to organize the array of personality traits according to their interrelations (Wiggins & Pincus, 1992). These models of personality share fundamental assumptions that traits are the basic building blocks of personality, that there are a finite number of basic traits, and that traits provide comprehensive coverage of human personality. There are several benefits to using such models. First, these models were developed in research efforts to identify and organize the primary building blocks of personality. Traits from these models, then, are based more in the science of personality and less in the minds of psychopathy observers and theorists. Second, because these models were identified in basic science efforts and not in efforts to predict specific criteria, problems with predictor-criterion overlap are minimized. Third, each of these models has been widely used and well validated in various kinds of research.

There are several structural models that have been examined in relation to psychopathy, including, most prominently, Eysenck's PEN model, Tellegen's three-factor model, and the five-factor model (FFM). Eysenck's PEN model includes factors of Neuroticism, Extraversion, and Psychoticism (Eysenck & Eysenck, 1970), originally derived from factor analyses of questionnaire items. Neuroticism entails emotional stability and adjustment; Extraversion reflects traits related to sociability and agency; and Psychoticism encompasses egocentricity, (lack of) interpersonal warmth and connectedness, (lack of) empathy, and impulsiveness. Tellegen's (1985) model also posits three basic dimensions, each marked by a set of primary trait scales. Positive Emotionality refers to the tendency of individuals to be positively engaged with others and the world around them; it is marked by scales labeled Well-Being, Social Potency, Social Closeness, and Achievement. Negative Emotionality reflects an individual's tendency to experience negative emotions (e.g., fear, anxiety, and anger) and his or her tendency to break down under stress; it is marked by subscales labeled Aggression, Alienation, and Stress Reaction. Finally, Constraint assesses an individual's ability to control impulses, act deliberately, avoid potentially dangerous situations, and endorse traditional values and standards; it is marked by subscales labeled Traditionalism, Harm Avoidance, and Control.

The FFM was derived from studies of the English language undertaken to identify the domains of personality functioning most important in describing oneself and others (Digman, 1990; John & Srivastava, 1999; Wiggins & Pincus, 1992). This lexical research emphasized five broad domains, identified as Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness (John & Srivastava, 1999). Extraversion entails an individual's proneness to positive emotions and sociability. Agreeableness is concerned with an individual's interpersonal relationships and strategies; people high in Agreeableness tend to be trusting, straightforward, and empathic, whereas those who score low tend to be manipulative, arrogant, and unconcerned about others. Conscientiousness relates to the "control of impulses," as well as to the ability to plan, organize, and complete behavioral tasks. The domain of Neuroticism entails emotional adjustment and stability. The fifth domain, Openness, refers to an individual's interest in culture, and the preference and interest in experiencing and exploring new activities, ideas, and emotions. Each of these five broad domains can be further divided into finer-grained facets or components. Costa and McCrae (1995a) have proposed six facets within each domain on the basis of their research with the NEO Personality Inventory-Revised (NEO-PI-R; Costa & McCrae, 1992). For example, they parse the domain of Agreeableness (vs. antagonism) into more specific facets of trust (vs. suspicion), straightforwardness (vs. deception), altruism (vs. exploitation), compliance (vs. aggression), modesty (vs. arrogance), and tendermindedness (vs. tough-mindedness).

Despite being derived independently, articulating different numbers of basic traits, and offering different levels of specificity, there is substantial agreement across the models in terms of the traits that are represented. The models all contain explicit representations of the "Big Two"-Extraversion (Positive Emotionality) and Neuroticism (Negative Emotionality). Additionally, the FFM and Tellegen's model both contain dimensions related to control of impulses and orientation to convention-Conscientiousness and Constraint. Eysenck's model contains Conscientiousness, although it is not associated uniquely with a single factor: Empirical work suggests that Eysenck's Psychoticism dimension can be considered a blend of low Conscientiousness and low Agreeableness (Costa & McCrae, 1995b). All models also contain representations of Agreeableness. In Eysenck's model, it is a component of the Psychoticism dimension. In Tellegen's model, it is represented primarily by subscales of the Negative Emotionality dimension (i.e., aggression and alienation). Thus, these structural models are far from discrepant with one another. In fact, Watson, Clark, and Harkness (1994) have argued that "the Big Three and Big Five models define a common 'Big Four' space in which (a) two traits are equivalent (Neuroticism and Extraversion), (b) the third Big Three dimension (Constraint or Psychoticism) represents some combination of two Big Five factors (Conscientiousness and Agreeableness), and (c) the final Big Five trait (Openness, or imagination) is excluded" (p. 24). They go on to label the Big Four as Neuroticism (or Negative Emotionality), Extraversion (or Positive Emotionality), Conscientiousness (or Constraint), and Agreeableness.

Markon, Krueger, and Watson (2005) empirically integrated these models along with models of disordered personality using meta-analytic structural equation modeling. Their results demonstrated congruence among traits from the FFM, MPQ, and PEN across levels of a trait hierarchy. At the two higher-order trait level, the first factor is marked by PEN Neuroticism and Psychoticism, FFM Neuroticism, Conscientiousness (negative), and Agreeableness (negative), MPQ stress reaction, alienation, aggression, and control (negative). The second factor is marked by PEN and FFM Extraversion and Multidimensional Personality Questionnaire (MPQ) Well-Being and Social Potency. At the three factor level, factors representing Neuroticism and Extraversion are present along with a factor representing a blend of FFM Agreeableness (negative) and Conscientiousness (negative), PEN Psychoticism, and MPQ Aggression, Control (negative), and Harm Avoidance (negative). At the four-factor level, they found the Big Four as described earlier. Neuroticism included PEN and FFM Neuroticism and MPQ Stress Reaction. Extraversion was marked by PEN and FFM Extraversion and MPQ Well-Being, Social Potency, and Social Closeness. A third factor was marked by PEN Psychoticism, FFM Agreeableness (negative), and MPQ Aggression and Harm Avoidance (negative). The fourth factor included FFM Conscientiousness and MPQ Control. In the five-factor model, the previous four factors remain identical but a fifth factor marked primarily by FFM Openness emerges.

Not only is there correspondence at the higher-order level, there is also fairly good correspondence at the level of the subscales, at least for the FFM and MPQ models, which have been the most widely studied in relation to psychopathy and whose subscales have been used to create proxies for psychopathy. Table 11.1 reports correlations for the three higher-order factors and 11 trait subscales of the MPQ (Tellegen & Waller, 2008) and operationalization of Tellegen's three-factor model with the domains and facets of the FFM as measured by the NEO-PI-R (Gaughan, Miller, Pryor, & Lynam, 2009). At the domain, or higher-order factor level, MPQ Positive Emotionality aligns well with NEO-PI-R Extraversion; MPO Constraint aligns well with NEO-PI-R Conscientiousness; and MPQ Negative Emotionality splits across NEO-PI-R Neuroticism and Agreeableness. This latter finding can be understood by considering the ways in which the MPQ subscales relate to the FFM domains; whereas MPQ Stress Reaction is most strongly related to FFM Neuroticism, the other two subscales (Aggression and Alienation) are most strongly related to FFM Agreeableness. The final column in the table provides the NEO-PI-R facet with the highest correlation for each of the MPQ trait subscales. In general, each MPQ subscale has a fairly clear counterpart in one FFM facet. With the exceptions of MPQ Alienation and Harm Avoidance, all correlations are .50 or higher.

In what follows, we use the FFM as the organizing structure with which to integrate various findings on psychopathy and personality. Our preference for the use of the FFM is driven by several factors. First, the FFM domains were derived from the natural language ensuring that important aspects of personality are represented (John & Srivastava, 1999). Second, the FFM, as represented by the NEO-PI-R, provides a reasonably extensive and fairly comprehensive lexicon of 30 facets versus the 11 subscales of the MPQ or the three factors of the PEN model. Third, the FFM, both at the domain and facet levels, enjoys considerable empirical support in the form of convergent and discriminant validation across self, peer, and spouse ratings (Costa & McCrae, 1988), temporal stability (Roberts & DelVecchio, 2000), cross-cultural support (Church, 2001; McCrae, Martin, & Costa, 2005), and behavior genetic support (Yamagata et al., 2006). The FFM has become the model of choice for both individual studies and meta-analytic reviews documenting the relations between basic personality traits and critical outcomes across a wide array of domains, including academic achievement (Poropat, 2009), work performance (Barrick & Mount, 1991) and satisfaction (Judge, Heller, & Mount, 2002), lead-

	FFM N	FFM E	FFM O	FFM A	FFM C	Highest NEO-PI-R facet r
MPQ PEM	20	.58	.10	12	.17	
Well-Being	46	.48	.09	.06	.06	E6: Positive Emotions (.50)
Social Potency	06	.41	.10	41	04	E3: Assertiveness (.69)
Achievement	.03	.14	.08	09	.47	C4: Achievement Striving (.60)
Social Closeness	23	.56	01	.28	03	E2: Gregariousness (.70)
MPQ NEM	.54	04	.04	50	10	
Stress Reaction	.77	12	.10	15	.03	N1: Anxiety (.69)
Aggression	.20	.04	.06	58	18	A4: Compliance (62)
Alienation	.37	16	05	38	12	A1: Trust (41)
MPQ CON	.14	13	38	.19	.59	
Control	.03	14	19	.11	.66	C6: Deliberation (.77)
Harm Avoidance	.14	14	28	.23	.30	C6: Deliberation (.37) E5: Excitement Seeking (–.37)
Traditionalism	.07	.02	36	.16	.27	O6: Values (53)
Absorption	.15	.20	.62	07	08	O2: Aesthetics (.66)

TABLE 11.1. Correspondence between the MPQ and the NEO-PI-R

Note. Results are taken from Gaughan et al. (2009).

ership (Judge, Bono, Ilies, & Gerhardt, 2002), physical (Bogg & Roberts, 2004) and psychological health (Malouff, Thorsteinsson, & Schutte, 2005; Samuel & Widiger, 2008), subjective wellbeing (DeNeve & Cooper, 1998), and relationship satisfaction (Malouff, Thorsteinsson, Schutte, Bhullar, & Rooke, 2010), to name just a few. With regard to behavioral outcomes of most relevance to psychopathy, the FFM has also been used to meta-analytically characterize the relations between personality and antisocial behavior (Jones, Miller, & Lynam, 2011; Miller & Lynam, 2001), substance use and abuse (Kotov et al., 2011), and risky sexual behavior (Hoyle, Fejfar, & Miller, 2000).

Fourth, in addition to the research base supporting the FFM, there is a substantial research base emanating from this model. Researchers have used the FFM to study the development and continuity of personality over time (e.g., Caspi, Roberts, & Shiner, 2005; De Clerq & De Fruyt, 2012; Tackett et al., 2012), as well as the levels of these traits as a function of gender, age, and culture (e.g., Allik & McCrae, 2004; Schmitt, Realo, Voracek, & Allik, 2008; Soto & John, 2012). Similarly, researchers have used the FFM as a framework to study the processes underlying and outcomes attributable to specific personality domains, such as the basic processes underlying Agreeableness (e.g., Graziano & Tobin, 2002). For instance, Robinson and colleagues have used a basic science approach to examine the way in which (dis)agreeable individuals interpret interpersonal and contextual cues and behave in more or less adaptive ways (Meier, Robinson, & Wilkowski, 2006, 2007; Robinson, Wilkowski, Meier, Moeller, & Fetterman, 2012). For instance, Meier and colleagues (2006) found that individuals high in Agreeableness were less susceptible to aggression-related cues and more likely to activate prosocial thoughts in response to such cues than were individuals low in Agreeableness. Impressively, Roberts and colleagues have developed a comprehensive line of research that has helped delineate the basic composition (e.g., Roberts, Chernyshenko, Stark, & Goldberg, 2005), correlates (e.g., Roberts, Jackson, Burger, & Trautwein, 2009), and consequences of Conscientiousness (e.g., Bogg & Roberts, 2004). Along similar lines, Lahey (2009) laid out in convincing fashion the public health significance and costs associated with Neuroticism, while Watson and colleagues have explicated the underlying structure of Extraversion/Positive Emotionality and its relations to various forms of mental illness (e.g., Naragon-Gainey, Watson, & Markon, 2009; Watson & Clark, 1997). DeYoung has systematically explored the broad domain of Openness/intellect, specifying its relation to cognitive ability (DeYoung, Quilty, Peterson, & Gray, 2014), describing its broad outlines (DeYoung, 2015), and identifying its sources (DeYoung, Peterson, & Higgins, 2005) and biological underpinnings (DeYoung et al., 2011). There are also multiple programs of research aimed at the basic processes underlying the facet-level traits within the FFM, including the work of Whiteside and Lynam (2001) on diverse personality pathways to impulsive behavior. Understanding personality disorders from the FFM framework allows this massive body of basic research to be brought to bear on personality disorder research to inform theorizing on assessment, etiology, course, and treatment.

Fifth, and perhaps most important, substantial research exists on personality and psychopathy employing the FFM framework. Expert ratings of prototypical cases of psychopathy have been conducted using the FFM (Miller, Lynam, Widiger, & Leukefeld, 2001). Similarly, the FFM has been used as a tool to translate prominent psychopathy assessments into a basic trait perspective (Widiger & Lynam, 1998). Empirically, the FFM has been examined in relation to all major psychopathy instruments (see meta-analyses by Decuyper, De Pauw, De Fruyt, De Bolle, & De Clerq, 2009; Lilienfeld, Watts, Smith, Berg, & Latzman, 2015; Lynam & Derefinko, 2006). In their recent meta-analysis, O'Boyle, Forsyth, Banks, Story, and White (2015) identified between 76 and 86 studies that reported on relations between one of more of the Big Five dimensions and one or more psychopathy instruments.

The advantages of trait-based approaches in conceptualizing, assessing, and diagnosing personality disorders are such that these approaches have now been included in the two most prominent psychiatric nosologies, the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association [APA], 2013) and the upcoming 11th edition of the International Classification of Diseases (ICD-11; see Tyrer, 2013). For example, the DSM-5 Personality and Personality Disorder Work Group proposed a diagnostic model in which personality disorders would be diagnosed on the basis of personality-related impairment in self and interpersonal functioning, as well as elevated scores on one or more traits from a new pathological trait version of the FFM. Although the trait-based approach did not replace the traditional approach to the diagnosis of personality disorders in DSM-5 (for a review of this decision, see Krueger, 2013; Miller & Lynam, 2013; Widiger, 2013), it was placed in Section III on "emerging measures and models" and may well become the predominant or only approach in future iterations. The inclusion of such a diagnostic model is evidence of the growing interest and support for such an approach. To date, research suggests that the DSM-5 FFM generally provides good coverage of the traditional personality disorders (e.g., Few, Miller, Rothbaum, et al., 2013; Hopwood, Thomas, Markon, Wright, & Krueger, 2012), including antisocial personality disorder (ASPD; Few, Lynam, Maples, MacKillop, & Miller, 2015), narcissism (Miller, Gentile, Wilson, & Campbell, 2013), and psychopathy (Strickland, Drislane, Lucy, Krueger, & Patrick, 2013).

### **FFM Profiles of Psychopathy**

Given the interest in trait-based models of personality disorders in general, and psychopathy specifically, we review work on psychopathy from the perspective of the FFM. Specifically, we draw on work that has used translations of psychopathy instruments, expert ratings, and empirical correlations to illustrate the robustness of an overall FFM profile of psychopathy. Next, we examine research demonstrating that the FFM can be used to assess psychopathy. Finally, we demonstrate the utility of conceiving of psychopathy as a collection of FFM traits.

#### FFM Translation

The first FFM-based approach to the development of a normative trait profile of psychopathy entailed the translation of the PCL-R (Hare, 2003) criteria into the language of the FFM (Widiger & Lynam, 1998). Beginning with narrative descriptions of the 20 PCL-R items, Widiger and Lynam identified NEO-PI-R facets that they believed captured the content of the descriptions. The first column in Table 11.2 provides the FFM profile for this translation, obtained by assigning a score of 0 to a facet that did not appear in any item translation (e.g., anxiety), a score of +1 (high) or -1 (low) to a facet that appeared in the translation of only one PCL-R item (e.g., angry hostility), and a score of +2 (high) or -2 (low) to a facet that appeared in the translation of more than one item (e.g., any facet of Agreeableness). From this PCL-R-based profile, psychopathic individuals are viewed as being low in depression from the domain of Neuroticism; warmth and positive emotions, from Extraversion; all facets of Agreeableness except trust; and four of six facets of Conscientiousness (dutifulness, achievement striving, self-discipline, and deliberation). Additionally, psychopathic individuals are rated as somewhat high in angry hostility and impulsiveness from the Neuroticism domain, and high in excitement seeking from Extraversion. No facets from the domain of Openness characterized psychopathy.

#### **Expert Ratings**

The second approach used to embed psychopathy within the broader framework of personality was to invite psychopathy experts to describe the personality of the prototypical Cleckley psychopath using the language of the FFM. Such descriptions improved upon the translational approach, as they are not bound by the conceptions of a small group of "translators." Additionally, aggregating the ratings brings out in stark contrast the aspects on which experts agree, and blunts the idiosyncratic elements of each description. Miller and colleagues (2001) wrote to 21 psychopathy researchers and asked each to "rate the prototypical, classic Cleckley psychopath" on each of 30 bipolar scales which corresponded to the 30 facets of the FFM. For example, to assess the facet of straightforwardness (a facet of Agreeableness), experts were asked "to what extent is the male [or female] psychopath honest, genuine, and sincere versus deceptive and manipulative?" Response choices ranged from 1 (extremely low) to 5 (extremely high). Experts were asked to rate a prototypic male and female psychopath; however, because results were similar across ratings for the two, we present only results for the prototypic male psychopath. Fifteen experts returned the ratings. The experts' mean ratings for each of the facets are given in the second column of Table 11.2. Miller and colleagues found remarkable agreement in the descriptions of the prototypical psychopath, an internal consistency finding that is itself encouraging. Taking any facet with an average rating less than 2 or greater than 4 as characteristic, the prototypical psychopathic individual is low in anxiety, depression, self-consciousness, and vulnerability from Neuroticism; low in warmth from Extraversion; low in openness to feelings from Openness; low in all facets of Agreeableness; and low in dutifulness, self-discipline, and deliberation from Conscientiousness. The prototypical psychopathic individual is also

NEO-PI-R	W & L translation	Expert	O'Boyle et al.
N1: Anxiety	.00	1.47	03
N2: Angry Hostility	1.00	3.87	.37
N3: Depression	-1.00	1.40	.10
N4: Self–Consciousness	.00	1.07	01
N5: Impulsiveness	1.00	4.53	.39
N6: Vulnerability	.00	1.47	.08
E1: Warmth	-1.00	1.73	24
E2: Gregariousness	.00	3.67	.00
E3: Assertiveness	.00	4.47	.09
E4: Activity	.00	3.67	.06
E5: Excitement Seeking	1.00	4.73	.28
E6: Positive Emotions	-1.00	2.53	17
O1: Fantasy	.00	3.07	.09
O2: Aesthetics	.00	2.33	04
O3: Feelings	.00	1.80	07
O4: Actions	.00	4.27	.09
O5: Ideas	.00	3.53	.04
O6: Values	.00	2.87	.06
A1: Trust	.00	1.73	35
A2: Straightforwardness	-2.00	1.13	56
A3: Altruism	-2.00	1.33	40
A4: Compliance	-2.00	1.33	47
A5: Modesty	-2.00	1.00	25
A6: Tender-Mindedness	-2.00	1.27	36
C1: Competence	.00	4.20	23
C2: Order	.00	2.60	25
C3: Dutifulness	-2.00	1.20	41
C4: Achievement Striving	-2.00	3.07	26
C5: Self–Discipline	-2.00	1.87	31
C6: Deliberation	-2.00	1.60	46
		Similarity indices <sup>a</sup>	
Experts	.67	,	
Meta-Analysis	.85	.67	

TABLE 11.2. FFM Profiles of Psychopathy Derived Using Different Approaches

*Note.* For the expert ratings (Miller et al., 2001), average ratings higher than 4 and lower than 2 are bolded. For the Widiger and Lynam translation (1998), traits that were included in at least one PCL-R item are **bolded**. For the average empirical correlational profile, correlations with absolute values greater than or equal to .20 are **bolded**.

<sup>a</sup>Similarity indices are the zero-order correlations between various columns.

high in impulsiveness from Neuroticism; in assertiveness and excitement seeking from Extraversion; in openness to actions from Openness; and in competence from Conscientiousness.<sup>1</sup>

#### Meta-Analysis

A third approach to generating an FFM profile of psychopathy is by correlating an explicit measure of psychopathy with a measure of the FFM. The logic of this approach is similar to the logic of the expert rater approach. Multiple assessment inventories have been derived using divergent approaches and conceptualizations; looking across these conceptions allows points of agreement to emerge and idiosyncratic aspects to be blunted. O'Boyle and colleagues (2015) have provided a comprehensive meta-analysis of studies reporting on the relations between FFM domains and facets and measures of the components of the Dark Triad, which consist of Psychopathy, Narcissism, and Machiavellianism. These authors identified between 76 and 86 studies (with N's ranging from 23,216 to 25,465) reporting on the relations between at least one FFM domain and one psychopathy measure. At the domain level, psychopathy is characterized by very low scores on Agreeableness (corrected r= -.53) and moderately low scores on Conscientiousness (corrected r = -.39); effect sizes were statistically significant but very small for Neuroticism (corrected r = .06), Extraversion (corrected r= .05), and Openness to experience (corrected r = .05). These results accord very well with previous meta-analytic reviews by Lynam and Derefinko (2006), Decuyper and colleagues (2009), and Lilienfeld and colleagues (2015). Lilienfeld and colleagues found that PCL-assessed psychopathy was most strongly related to Agreeableness (r = -.32)and Conscientiousness (r = -.14), and unrelated to Neuroticism (r = .06), Extraversion (r = .02), and Openness (r = .01).

More relevant to our purposes here, however, O'Boyle and colleagues (2015) also meta-analyzed between 11 and 19 studies (with N's ranging from 2,267 to 4,733) that reported on the relations between at least one of 30 facets of the FFM and one psychopathy instrument. Corrected, average correlations are reported in the last column of Table 11.2. As with other descriptions, the empirical results highlight the role of traits from Agreeableness and Conscientiousness, as well as mixed relations for Neuroticism (e.g., high anger and impulsiveness) and Extraversion (e.g., low warmth; high excitement seeking).

In general, the empirically derived FFM profile of psychopathy is robust across different assessment instruments. Table 11.3 presents the FFM profiles for seven different self-report psychopathy measures, based on data from available studies reporting correlations for one or more of these inventories. Although each of these inventories owes much to Cleckley's (1941/1988) seminal description, each was formulated independently by a different group of researchers. Lilienfeld developed the Psychopathic Personality Inventory (PPI) based on a comprehensive review of the theoretical and empirical literature that included the work of Cleckley and Hare among others (see Lilienfeld & Andrews, 1996). The Self-Report Psychopathy scale, Version III (SRP-III; Williams, Paulhus, & Hare, 2007), originated as a self-report version of the Hare PCL-R (Hare, 1991). The Levenson Self-Report Psychopathy scale (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995) was developed to capture the primary/secondary distinction described by Karpman (1948) and partially operationalized in the two factors of the PCL-R. The Youth Psychopathic Traits Inventory (YPI) was created to assess "the core personality traits of the psychopathic personality constellation" (Andershed, Kerr, Stattin, & Levander, 2002, p. 134). Specifically, the authors sought to represent traits evident in the descriptions of both Cleckley and Hare related to interpersonal style, emotional/affective traits, and impulse control, without reference to explicit antisocial behaviors. Based on a review of historical and contemporary conceptions of psychopathy, Patrick, Fowles, and Krueger (2009) offered a triarchic model that is operationalized using the Triarchic Psychopathy Measure (TriPM; Patrick, 2010). The Elemental Psychopathy Assessment (EPA; Lynam et al., 2011), discussed in more detail later, was developed as an extension of previous research on the FFM profile of psychopathy. Finally, the DSM-5 Section III trait profile appears to be based on a trait description of ASPD from Section II (i.e., manipulativeness, deceitfulness, callousness, hostility, irresponsibility, impulsivity, and risk taking), along with traits specifically designed to assess fearless dominance or "boldness" in the triarchic model (i.e., low anxiousness, low withdrawal, and attention seeking).

The bottom of Table 11.3 provides correlations among the profiles that index their degree of similarity. With a few exceptions, agreement is fairly high across approaches: correlations range from .54 (LSRP with DSM-5) to .97 (PPI with EPA), with an average of .82. As with the meta-analytic

	Empirical relations								
NEO-PI-R	PPI	SRP	LSRP	YPI	TriPM	EPA	DSM-5		
N1: Anxiety	37	20	05	21	09	36	14		
N2: Angry Hostility	.17	.30	.45	.27	.18	.33	.26		
N3: Depression	01	.12	.16	02	02	07	05		
N4: Self-Consciousness	24	13	.14	17	15	22	15		
N5: Impulsiveness	.11	.23	.13	.13	.23	.15	.43		
N6: Vulnerability	20	06	.26	.09	06	13	.05		
E1: Warmth	21	24	45	32	05	24	.18		
E2: Gregariousness	.08	.00	13	01	.02	.06	.31		
E3: Assertiveness	.31	.09	03	.13	.25	.32	.41		
E4: Activity	.06	.00	15	01	.17	.08	.29		
E5: Excitement Seeking	.23	.26	.07	.07	.28	.26	.53		
E6: Positive Emotions	18	24	45	30	.09	21	.23		
O1: Fantasy	02	.16	18	05	.17	01	.16		
O2: Aesthetics	02	06	22	08	.07	07	.13		
O3: Feelings	26	13	39	28	.12	23	.14		
O4: Actions	.24	.14	.02	.10	.14	.14	.19		
O5: Ideas	03	.21	24	07	.09	.00	.05		
O6: Values	06	.06	21	17	05	05	07		
A1: Trust	15	37	48	35	18	33	07		
A2: Straightforwardness	52	62	61	57	34	61	60		
A3: Altruism	41	46	62	50	22	47	31		
A4: Compliance	37	38	49	38	30	55	48		
A5: Modesty	37	26	41	46	27	47	42		
A6: Tender-Mindedness	35	39	54	33	11	42	01		
C1: Competence	24	30	42	25	20	23	26		
C2: Order	20	24	26	17	16	24	11		
C3: Dutifulness	26	27	46	39	31	31	37		
C4: Achievement Striving	17	17	34	19	11	12	.02		
C5: Self-Discipline	21	21	38	24	23	20	18		
C6: Deliberation	49	42	35	37	34	48	65		
			Sim	ilarity ind	lices <sup>a</sup>				
	PPI	SRP	LSRP	YPI	TriPM	EPA			
SRP	.88								
LSRP	.66	.80							
YPI	.88	.91	.89						
TriPM	.86	.85	.60	.81					
EPA	.97	.92	.74	.93	.88				
DSM 5	.85	.77	.54	.78	.94	.86			

TABLE 11.3. Correlations between NEO-PI-R Facets and Psychopathy Total Scores

*Note.* A subset of the correlations for the PPI, SRP, and LSRP were previously reported in Lynam et al. (2011). The correlations for the YPI subscales are computed on data reported in Sherman et al. (2014). Correlations for the TriPM are taken from Poy, Segarra, Esteller, Lopez, and Molto (2014). Correlations for DSM-5 were computed from data reported in Few et al. (2013b).

<sup>a</sup>Similarity indices are the zero-order correlations between various columns.
profile, the largest and most robust FFM correlates of psychopathy are facets of Agreeableness (particularly, straightforwardness, altruism, compliance, and modesty) and certain specific facets from Conscientiousness, namely, deliberation and dutifulness. Slightly less robust and somewhat smaller correlations are evident for angry hostility and impulsiveness from the Neuroticism domain, excitement seeking and assertiveness from Extraversion, tendermindedness and trust from Agreeableness, and competence and self-discipline from Conscientiousness.

# An FFM—Psychopathy Composite

Despite differences in approach and methodology, the FFM description of psychopathy that emerges is fairly similar across translational, expert-rater, and empirical approaches. The similarities in these approaches, summarized at the bottom of Table 11.2, are relatively high: .67 for the expert and translational profiles, .67 for the expert and empirical profiles, and .85 for the empirical and translational profiles. Eleven traits are descriptive of psychopathy across all three methods, one from Neuroticism (i.e., impulsiveness), two from Extraversion (i.e., low warmth and high excitement seeking), five from Agreeableness (i.e., low straightforwardness, low altruism, low compliance, low modesty, and low tender-mindedness), and three from Conscientiousness (i.e., low dutifulness, low self-discipline, and low deliberation). Four other traits appear as characteristic in two of the approaches, namely, low anxiety, high angry hostility, and low depression from the Neuroticism domain, and low trust from Agreeableness. Figure 11.1 provides a graphic representation of the profiles from these three approaches, highlighting their convergence.

# Assessing Psychopathy with the FFM NEO-PI-R Studies

In addition to demonstrating a consistent and robust FFM profile of psychopathy, we have also demonstrated that psychopathy can be assessed using the FFM. If the nomological network that surrounds explicit assessments of psychopathy can



**FIGURE 11.1.** Three approaches to generating FFM profiles of psychopathy. Each profile in Table 11.2 was transformed into *T*-scores by subtracting the column average from each number, dividing by the standard deviation of the column, multiplying this number by 10, and adding 50.

be recreated by FFM-assessed indices of psychopathy, then the argument that psychopathy is this collection of traits is strengthened. Results from multiple studies (Derefinko & Lynam, 2006; Miller et al., 2001; Miller, Jones, & Lynam, 2011; Ross, Benning, Patrick, Thompson, & Thurston, 2009) show high convergence between FFM-assessed psychopathy and explicit indices of psychopathy, including the LSRP, SRP-III, PPI-R, and the YPI. Using the original data from Lynam and colleagues (2011) for the PPI, SRP, and LSRP, from Sherman, Lynam, and Heyde (2014) for the YPI, and from Few, Miller, Rothbaum, and colleagues (2013) for DSM-5, Lynam and Miller (2015) examined the convergent correlations between these five psychopathy scales and FFM psychopathy scores computed from the NEO-PI-R; these convergent correlations range from .63 for the YPI to .72 for the PPI, with an average of .66. Additionally, across samples of undergraduates (Miller & Lynam, 2003), community participants (Miller, Gaughan, et al., 2011), and drug abusers (Derefinko & Lynam, 2007), relations of FFM psychopathy scores to external criteria (e.g., antisocial behavior, aggression, substance use, and other forms of psychopathology) mirror those found when explicit assessments of psychopathy are used.

Several studies have also used Tellegen's MPQ to create proxy measures of the Psychopathic Personality Inventory (Tellegen & Waller, 2008). For example, Benning, Patrick, Blonigen, Hicks, and Iacono (2005) used multiple regression to estimate the two factors of the PPI from scores on the 11 trait scales of the MPQ. These authors found that MPQ-estimated PPI factors exhibited expected relations with a variety of criterion variables, including personality, psychopathology, and psychopathy measures across three participant samples. These MPQ-based psychopathy proxies have also been used in behavioral genetic studies of psychopathy (e.g., Blonigen, Hicks, Krueger, Patrick, & Iacono, 2005; Hunt, Bornovalova, & Patrick, 2015).

#### Studies Using the Elemental Psychopathy Assessment

Most recently, we have developed a psychopathyspecific FFM assessment based on previous work using the NEO-PI-R. This was done in response to general concerns that instruments developed in the general population to assess personality in that population (e.g., the NEO-PI-R) may not be optimal for assessing pathological personality traits. Our response has been to use the basic structure of the FFM to build new scales that remain tied to basic personality science, yet better assess the more pathological ends of basic trait dimensions (see Lynam, 2012). Lynam and colleagues (2011) began with a consensus profile of psychopathy (Lynam & Widiger, 2007a) that included 18 traits. All six facets from Agreeableness were included (trust, straightforwardness, altruism, compliance, modesty, tendermindedness), as were the six facets of Neuroticism, although some represented high levels (i.e., angry hostility and impulsiveness), whereas others reflected low levels (i.e., anxiety, depression, self-consciousness, and vulnerability). Three facets from Conscientiousness were also included (i.e., dutifulness, self-discipline, and deliberation), along with three facets from Extraversion representing, like the facets from Neuroticism, both high (i.e., assertiveness and excitement seeking) and low levels of Extraversion (i.e., warmth). Items were written that described more maladaptive, extreme, and/or psychopathy-specific manifestations of the original facet dimensions; the polarity of some facet scales was also reversed so that higher scores on all scales were indicative of psychopathy.

The initial 299-item pool for the EPA was administered to over 900 participants. Through standard item selection procedures, nine-item scales were formulated for each of the 18 elements of psychopathy, with two eight-item scales serving as validity indicators. All scales exhibited high internal consistency and factorial unidimensionality. The EPA scales remained true to their FFM origins as was evident in the high average convergent correlation of .66 between the EPA scales and their respective NEO-PI-R facets, as well as the recovery of the original five-factor structure in a joint factor analysis with the NEO-PI-R (Lynam et al., 2011).

A number of articles support the construct validity of the EPA. Lynam and colleagues (2011) reported validity data for the EPA in both the derivation sample and a sample of incarcerated men. Within the derivation sample, Lynam and colleagues examined convergent relations of the EPA with three explicit psychopathy measures-the LSRP, SRP-III, and PPI-R. The convergent correlations were substantial ( $\approx$  .80) and were significantly higher than those observed for NEO-PI-R-assessed psychopathy. In the prison sample, the EPA scales manifested substantial convergent validity with scores on the SRP-III and were correlated with self-reported externalizing behaviors and officially recorded disciplinary infractions. Wilson, Miller, Zeichner, Lynam, and Widiger (2011) demonstrated high convergence between the EPA and explicit psychopathy measures, as well as significant correlations between the EPA and several relevant outcomes including antisocial behavior, reactive and proactive aggression, and substance use. Miller, Gaughan, and colleagues (2011) examined correlations for the EPA with scores on the FFM domains derived from self-reports and "thin slice" ratings (trait ratings made by strangers after viewing 60-second video clips of participants) and also with self-report measures of personality disorders, social cognition, and love styles. The EPA total and facet scores showed expected correlations with both self- and "thin slice" ratings of FFM domains such that EPA scores were negatively correlated with both self and thin-slices ratings of Agreeableness and Conscientiousness. EPA scales were also related, as expected, to relevant personality disorders, including ASPD and narcissistic personality disorder, as well as angry and aggression-related social cognitions in response to provocative hypothetical scenarios. Finally, as expected, EPA scores were correlated with romantic "love styles" indicative of game playing and infidelity.

One benefit of the EPA is its ability to examine psychopathy using 18 well-articulated, lower-order facets to better understand what specific traits drive psychopaths' relations with important etiological factors and relevant outcomes. Nonetheless, these 18 subscales can be organized into a higher-order structure that may prove fruitful for use in research as well. Few, Miller, and Lynam (2013) examined the factor structure of the EPA facet scales in two large undergraduate samples. The analysis for each sample revealed four factors-Antagonism, Emotional Stability, Disinhibition, and Narcissism. Antagonism is marked by trait scales of callousness, coldness, distrust, manipulation, and selfcenteredness. Emotional Stability includes trait scales of invulnerability, self-contentedness, and unconcern. Disinhibition includes trait scales of disobliged, impersistence, oppositionality, rashness, thrill seeking, and urgency. Finally, Narcissism encompasses the trait scales of anger/hostility, arrogance, dominance, and self-assurance. In the Few and colleagues study, the EPA factors related as expected to scales from alternative self-report measures of psychopathy and externalizing behaviors, and demonstrated incremental validity in predicting psychopathy and externalizing behaviors above and beyond the other psychopathy measures.

The EPA was recently tested in a sample of community participants preselected to overrepresent higher psychopathy scores (Miller, Hyatt, Rausher, Maples, & Zeichner, 2014). Self-report EPA total and factor scores were substantially correlated with self- and informant reports of SRP-III psychopathy and evinced significant and expected correlations with other constructs of the Dark Triad (e.g., Narcissism) and with externalizing behaviors (e.g., aggression and antisociality). Similarly, Crego and Widiger (2014) reported substantial correlations in two samples for the EPA factors with theoretically relevant subscales from other psychopathy measures, including the TriPM. For instance, TriPM Boldness was correlated with both the Narcissism and Emotional Stability factors of the EPA. Finally, Lynam and colleagues (2013) used item response theory analyses to create a shorter version of the EPA (178 items reduced to 88). The EPA short form (EPA-SF) reproduced the factor structure of the original inventory, as well the correlations between the original EPA and a variety of criterion measures (e.g., other psychopathy scales, the FFM, and a number of externalizing behaviors). Importantly, the relations were reproduced at not just at the total score level but also the level of the 18 subscales.

## **Subscale-Level Differences in Emphasis**

Despite general agreement as to which traits characterize psychopathy at the level of the total score, there are differences among psychopathy inventories (as shown in Table 11.3) at the subscale and factor levels, and in their representation of each aspect of the overall FFM profile. We illustrate these differences using the seven psychopathy measures described earlier and referenced in Table 11.3, each of which includes between two and four subscales. The PPI includes two higher-order scales (Fearless Dominance [FD] and Self-Centered Impulsivity [SCI; Benning, Patrick, Hicks, Blonigen, & Krueger, 2003]). FD is said to reflect social and physical boldness in conjunction with emotional stability, whereas SCI captures grandiosity, manipulativeness, nonconformity, and impulsivity. The SRP-III has four subscales: Interpersonal Manipulation, Callous Affect, Erratic Lifestyle, and Criminal Tendencies (Paulhus, Hemphill, & Hare, in press). The LSRP includes two factor scales, a Primary (Factor 1) scale that assesses a selfish, callous, uncaring, and manipulative orientation to others and a Secondary (Factor 2) scale that assesses impulsivity, reactivity, and poor behavioral controls (Levenson et al., 1995). There are three higher-order factors for the YPI: Grandiose-Manipulative, Callous-Unemotional, and Impulsive-Irresponsible (Andershed et al., 2002). The recently developed TriPM consists of three subscales (Meanness, Disinhibition, and Boldness), whereas the EPA consists of 18 subscales that can be grouped into four factors. Finally, there are two components to the DSM-5 Section III trait characterization of psychopathy: ASPD, which includes traits from both Antagonism (i.e., manipulativeness, callousness, deceitfulness, and hostility) and Disinhibition (i.e., risk taking, impulsivity, irresponsibility), and the Psychopathy Specifier (PS; i.e., low anxiousness and withdrawal; high attention seeking).

To identify similarities and differences in the FFM profiles for the various scales from these differing psychopathy measures (20 in all), we conducted an exploratory factor analysis of the 20 FFM correlational profiles presented in Table 11.4. In this analysis, the columns of correlations in Table 11.4 were treated as variables, whereas the FFM facets were treated as cases in a factor analysis. Using principal components analysis (PCA) with a varimax rotation, three factors were extracted, which accounted for 93.1% of the total variance, based on examination of the eigenvalues (first five eigenvalues: 9.93, 3.37, 1.59, 0.34, and 0.28), the scree plot, and parallel analysis. PCA was used given that the purpose was data reduction and varimax rotation in order to identify the most separate clusters of profiles; however, results were similar using other extraction (e.g., principal axis factoring) and rotation (e.g., oblimin) methods. Figure 11.2 displays the average NEO-PI-R profile for each of these principal components, highlighting both the similarities and differences among them; these average profiles were created by assigning each profile to the component on which it had the highest loading and then averaging across each facet within each component. The first two components are relatively consistent with traditional conceptions of "Factor 1" and "Factor 2" psychopathy, although they are reversed in this analysis. The first component includes FFM profiles for scales from each inventory that align closely with "Factor 2" descriptions of psychopathy assessing primarily low Agreeableness and low Conscientiousness, and some degree of high Neuroticism, especially angry hostility and impulsiveness (e.g., Lynam & Derefinko, 2006). The second component includes profiles for subscales that align more closely with traditional "Factor 1" descriptions of psychopathy from the YPI, the SRP-III, and the LSRP, but not from the PPI, DSM-5, or TriPM. These scales assess primarily low Agreeableness and certain aspects of low Extraversionlow warmth and low positive emotions. The third component (i.e., FD/Boldness) includes factors from the PPI, EPA, DSM, and TriPM and is quite discrepant from the other two components. To the extent that these scales relate to Agreeableness and Conscientiousness, they tend to be positively related. Their strongest relations are to Neuroticism (negative) and Extraversion (positive). In summary, although the different psychopathy measures generate similar FFM profiles at the total score level, the profiles differ at the subscale level both within and across inventories.

# Advantages to Understanding Psychopathy Using the FFM

There are a number of advantages to understanding psychopathy as a constellation of traits from the FFM that derive from the breadth and articulation of the FFM itself and the enormous research base that supports it. These advantages include, among others, the ability to account for the factor structures of various inventories, to make sense of available epidemiological data pertaining to psychopathy, to interpret the putative etiologically relevant deficits associated with psychopathy, and to provide for a connection to basic research in personality.

## The Factor Structures of Psychopathy Inventories

The FFM can be used to understand the factor structures of various established inventories of psychopathy. Items/subscales cohere with one another, and factors correlate with each other to the extent that they assess similar FFM traits, and they diverge to the extent that the traits they assess are different. The PCL-R serves as an excellent example. The FFM translation of the PCL-R shows that Factor 1 is mostly a measure of low Agreeableness, whereas Factor 2 is a measure of low Agreeableness and low Conscientiousness, with some aspects measuring low and high elements of Neuroticism and Extraversion (Widiger & Lynam, 1998). The PCL-R factors correlate highly because both assess Agreeableness but are not isomorphic because Factor 2 also includes a substantial amount of Conscientiousness. Similar patterns have been found using the Childhood Psychopathy Scale (CPS; Lynam, 1997), with Agreeableness accounting for large portions of the variance in Factor 1 and Factor 2, and Conscientiousness and Neuroticism also contributing to Factor 2 (Lynam et al., 2005). Furthermore, when Agreeableness was partialed out of the two factors, their intercorrelations were significantly reduced. Sherman and colleagues (2014) used the FFM to examine the higher-order

			Ar	Prof	file Fact m + Dis	or 1: sinhibiti	uo					Prof Aı	file Fact ntagoni	or 2: sm			Profi	le Factc Domii	or 3: Fea nance	rless
O-PI-R	PPI SCI	SRP EL	SRP ASB	LSP F2	II	TP Mea	TP Dis	EPA Dis	DSM APD	SRP IPM	SRP CA	LSP F1	YPI GM	YPI CU	EPA Ant	EPA Nar	PPI FD	TP Bol	EPA ES	DSM PS
: Anxiety	.10	25	10	11.	10	.05	.27	.03	.22	07	22	13	12	32	08	22	62	52	81	65
: Angry Hostility	.49	.17	.22	.53	.26	.31	.46	.43	.56	.35	.21	.32	.27	.17	.42	.39	29	27	44	29
3: Depression	.39	.10	.15	.37	20.	.14	.39	.31	.29	.14	00.	.02	02	-00	.17	11	39	54	71	60
4: Self-Conscious	.18	21	.02	.27	11	.08	.22	.13	.19	04	14	.04	14	16	60.	30	55	63	63	61
5: Impulsiveness	.33	.36	.15	.28	.33	.19	.49	.42	.52	.21	02	.02	.10	11	.04	.12	13	02	34	08
5: Vulnerability	.28	02	.10	.47	.24	.14	.33	.30	.37	05	21	.11	.05	06	.08	13	59	57	76	56
: Warmth	43	03	17	31	09	28	22	23	22	23	36	44	27	46	59	.08	.31	.35	.15	.73
: Gregariousness	13	.19	02	06	.19	14	14	.02	06	03	16	14	.01	23	27	.30	.36	.34	.13	.71
: Assertiveness	.01	.15	03	12	.05	.02	04	03	.10	60.	20.	.03	.21	.08	02	.64	.51	.67	.36	.61
: Activity	14	.10	10	12	.01	00.	60.	07	.01	03	00.	-14	.08	12	16	.32	.32	.42	.17	.55
: Excitement Seeking	.01	.42	.04	.07	.19	.27	.28	.25	.43	.18	.14	.06	.06	-00	04	.25	.44	.30	.18	.26
: Positive Emotions	34	03	17	40	08	12	14	23	14	23	35	39	23	46	52	.03	.24	.50	.19	69.
: Fantasy	01	.25	60.	12	.06	.16	.14	.11	.15	.15	02	19	01	19	14	04	.07	.19	.01	6
2: Aesthetics	03	.07	.10	09	01	05	.07	.01	.01	09	25	24	03	16	16	04	.13	.19	02	.23
3: Feelings	21	.03	09	26	04	07	.03	09	00.	07	32	39	22	47	39	.02	02	.38	15	.27

y Subscales
sychopath
acets and P
NEO PI-R f
veen
betv
Correlations betv

O4: Actions	.06	.31	.11	.12	.19	00.	.03	.16	03	02	.04	03	.05	02	05	20.	.34	.37	.15	.41
O5: Ideas	13	.23	.16	25	09	02	04	09	04	.15	.12	20	02	07	08	00.	.19	.32	.22	.16
O6: Values	11	.12	.11	15	02	15	10	00	09	20.	11	20	20	19	13	07	60.	.11	.05	.04
A1: Trust	34	15	19	42	20	39	35	25	37	47	38	43	33	35	60	17	.22	.23	.21	.53
A2: Straightforward	54	44	38	35	39	33	30	41	68	72	42	64	62	44	64	45	15	37	09	.04
A3: Altruism	61	29	28	51	27	45	27	41	48	41	50	57	44	55	65	24	.18	60.	.10	.25
A4: Compliance	37	31	09	45	31	39	36	39	53	44	33	42	36	29	48	59	11	15	.01	.01
A5: Modesty	32	19	15	15	29	30	15	20	28	29	18	47	51	35	43	51	13	36	17	30
A6: Tender-Minded	29	22	20	33	18	29	05	23	11	31	51	56	28	36	54	27	07	.01	08	.17
C1: Competence	50	37	35	55	35	31	52	55	46	17	06	28	13	16	32	.10	.24	.28	.34	.30
C2: Order	29	29	20	41	34	17	35	43	17	15	11	13	07	03	11	00.	01	.06	.03	60.
C3: Dutifulness	49	31	29	49	48	38	55	55	46	23	02	36	27	24	33	03	.20	.08	.27	.10
C4: Achievement Striving	39	23	21	47	29	20	30	44	17	10	02	22	04	13	18	.27	.21	.19	.20	.33
C5: Self-Discipline	47	26	23	59	40	30	51	57	33	16	00.	20	11	10	22	.10	.20	.16	.37	.24
C6: Deliberation	52	66	30	45	51	30	61	71	67	23	11	24	28	15	18	20	22	06	00.	07
Note. A subset of the correlation Lynam et al. (2011). The correlatine taken from Poy, Segarra, Esteller computed from data reported in equal to .25 are italicized.	s for the ions for Lopez, Few et a	Psychof the You and Mo ul. (2013	pathic Pe uth Psych Ito (201 <sup>4</sup> ). Negat	ersonalit hopathic 4). Corre ive corre	y Invento Traits Ir slations f	ory (PPI), nventory or the El <i>i</i> th abso	Self-Re (YPI) su emental lute valu	port Psyc lbscales v Psychop ies greati	chopathy were repo athy Ass er than o	Scale (S orted in S sessment or equal 1	RP), and Sherman were coi to .25 are	ILevens et al. (2 mputed c	on Self-F 014). Cc on the da wherea	keport Ps rrelatior ata from s positive	ychopatl us for the Lynam e correlat	y scale (Triarchi t al. (201 ions with	LSP) wer c Psycho 1). Corre	e previou pathy Mc elations f e values	usly repo easure (T or DSM- greater th	Ted in (P) are vere



**FIGURE 11.2.** FFM profiles of psychopathy factors. Correlations from Table 11.4 were transformed into *T*-scores in two steps. First, correlations were averaged across scales within each factor. Second, these correlations were converted to *z*-scores using the average correlation and standard deviation of all correlations between the psychopathy scales and the NEO-PI-R in Table 11.4. Correlations for the domains were computed by averaging the correlations for the facets that contribute to them.

structure of the YPI, which consists of 10 scales that combine to form three first-order factors that in turn form a second-order factor labeled "psychopathic personality" (Andershed et al., 2002). Sherman and colleagues showed that the higher-order "psychopathic personality" factor could be largely accounted for by the six Agreeableness facets of the NEO-PI-R. Most recently, Lynam and Miller (2015) showed that Agreeableness accounted for much of the overlap between the two LSRP factors (accounting for over 80% of their correlation), as well as the overlap among the four SRP-III factors. The SRP-III provides a particularly interesting case, as it has two first-order factors, as well as an overarching second-order factor. The two firstorder factors comprise Interpersonal Manipulation (IPM)/Callous Affect (CA) and Erratic Lifestyle (ELS)/Antisocial Behavior (ASB). In the majority of the analyses, Agreeableness reduced the overlap between the first-order factors by more than 50%. The only exception was for overlap of the Factor 2

subscales ELS and ASB, which required the addition of Conscientiousness to be reduced by more than 50%. When the four SRP-III subscales were combined to form the higher-order factors, Agreeableness accounted for over 60% of their overlap. In the end, like the measure from which it was derived (the PCL-R), SRP-III Factor 1 subscales (i.e., IPM and CA) assess primarily Agreeableness, whereas the Factor 2 subscales (i.e., ELS and ASB) assess both Agreeableness and Conscientiousness; the two factors cohere into a higher-order factor due to the shared assessment of Agreeableness.

# Accounting for the Epidemiology of Psychopathy

Understanding psychopathy using traits from the FFM provides a parsimonious and compelling explanation for many of the epidemiological facts that surround psychopathy, specifically its relations to other personality disorders, and its distribution across gender and age. This explanation makes use of the vast empirical literature on the FFM, which provides the FFM coordinates for all personality disorders, gender differences in each of the facets, as well as the relations between age and mean trait levels.

In terms of comorbidity, psychopathy and other personality disorders should be comorbid to the extent that they assess similar traits. Following Lynam and Widiger (2001), Lynam and Derefinko (2006) generated correlations between the FFM profiles for psychopathy and the other personality disorders, providing a comorbidity estimate for psychopathy with each personality disorder. Some personality disorders were predicted to be highly comorbid with psychopathy, whereas others were predicted to be very distinct. For example, psychopathy and ASPD should be highly comorbid (i.e., predicted r = .88), as both are characterized by low scores on all facets of Agreeableness, several facets of Conscientiousness, anxiousness, and selfconsciousness, and high scores on impulsiveness, assertiveness, and excitement seeking. In contrast, psychopathy should not co-occur with dependent personality disorder (i.e., predicted r = -.84), as they are characterized by opposite poles of the Agreeableness facets, several Neuroticism facets (i.e., anxiousness, self-consciousness, and vulnerability), and two facets of Extraversion (i.e., assertiveness and excitement seeking). These predicted comorbidities were compared to meta-analytically derived comorbidities; the predicted and obtained comorbidities corresponded extremely well with one another (r = .92).

With regard to gender differences, Lynam and Widiger (2007b) used what is known about gender differences in FFM traits to predict similar differences in personality disorders. Specifically, using expert-generated NEO-PI-R profiles for each personality disorder and data on sex differences in the NEO-PI-R from a large U.S. sample, Lynam and Widiger estimated the expected sex differences for each DSM personality disorder. These expected differences are large for personality disorders characterized by NEO-PI-R facets that exhibit large sex differences. For example, men score lower than women on all facets of Agreeableness, anxiousness, self-consciousness, and vulnerability; ASPD is characterized by low scores on all of these facets as well. Thus, ASPD was predicted to be more common among men than women. These FFM-based estimates were then compared to results from a meta-analysis of sex differences in the personality disorders, obtained using explicit personality disorder measures. Using observed sex differences in psychopathy from five different samples, Lynam and Miller (2015) extended these results to include psychopathy. Lynam and Miller found, based on known sex differences in the FFM facets, that psychopathy was predicted to have the largest sex differences of all of the personality disorders (with men scoring higher) and it was observed to have the largest sex differences based on explicit assessments of psychopathy. In fact, across the personality disorders, the estimated differences were quite similar to the observed differences, with correlations between expected and observed differences equal to about .79 when raw effect sizes were used, and .80 when ranks were used.

Using similar logic, Vachon and colleagues (2013) examined the ability of the FFM to account for age-related changes in psychopathy assessed via the PCL-R (Hare, 2003). Specifically, these authors suggested that the prevalence of psychopathy will change across the life course in synchrony with normative changes in the FFM traits underlying psychopathy. These authors used information from a large sample of adolescents and adults (i.e., N = 1,135) to identify normative changes in absolute levels of the traits that comprise psychopathy (McCrae et al., 2005). Using FFM profiles of overall psychopathy, Factor 1, Factor 2, and ASPD as a comparison, the authors used the normative information on trait changes to make specific predictions about changes in psychopathy across the life course. These predicted changes were compared to prevalence estimates based on the explicit assessment of psychopathy in a forensic setting. Results demonstrated that the FFM trait information (1) predicted the rate of decline for psychopathy over the lifespan, (2) discriminated the decline of psychopathy from that of a similar disorder, ASPD, and (3) accurately predicted the differential decline of two psychopathy factors. These findings demonstrate that basic traits provide a parsimonious account of prevalence of psychopathy across the lifespan.

#### An FFM-Based Interpretation of Possible Etiologically Relevant Deficits

Much research in psychopathy is aimed at identifying *the* core deficit underlying the disorder. Many candidate deficits have been proposed; unfortunately, these various deficits are not easily subsumed under a single construct; that is, there is not a singular etiology; rather, many deficits seem to contribute to the disorder. This is exactly the state of affairs to be expected if psychopathy were a constellation of diverse traits from a general model of personality; different researchers have zeroed in on different elements or domains of the larger psychopathy personality profile. For example, several theories suggest that psychopathy is rooted in deficient fear conditioning (Lykken, 1995). Patrick (1994) has related fear-potentiated startle response to the broad domain of negative affectivity: "The observed absence of startle potentiation in psychopaths (Patrick, Bradley, & Lang, 1993) may reflect a temperamental deficit in the capacity for negative affect" (p. 325). In contrast to deficient fear conditioning, Newman's (1998) response modulation model is focused on a different area of functioning. Newman has offered evidence that psychopaths have a difficult time suspending a reward-based response set in order to assimilate feedback from the environment. This deficit is more likely to be related to aspects of psychopathy related to impulse control-impulsiveness, excitement seeking, and facets from Conscientiousness. Still other researchers have focused on deficits in empathic responding as a core deficit of psychopathy. Blair (2001) has argued that psychopathic emotional processing deficits are best explained by the violence inhibition mechanism (VIM) model. Specifically, the psychopath's abnormal affective processing is due to compromised functional integrity of the emotional system that responds to sad and fearful displays. These deficits in empathy would seem to align fairly straightforwardly with low Agreeableness.

#### **Connection to Basic Personality Science**

There are ways other than the FFM or EPA to parse the broad psychopathy construct. Hare and Neumann (2006) speak in terms of Interpersonal Manipulation, Callous Affect, Erratic Lifestyle, and Antisocial Behavior, or Factor 1 and Factor 2. Lilienfeld and Widows (2005) speak primarily in terms of FD and SCI (with some less frequent discussion of Coldheartedness). Patrick and colleagues (2009) have recently offered a triarchic model that characterizes psychopathy in terms of meanness, boldness, and disinhibition facets. However, the FFM and EPA provide for connection to the extensive research base of personality science. For instance, there is little ongoing research into the roles of Interpersonal Manipulation, FD, or Boldness in other personality disorders (e.g., narcissistic) or maladaptive personality styles (e.g., Dark Triad; Paulhus & Williams, 2002). Few researchers are studying developmental change, cultural differences, or sex differences in Erratic Lifestyle, SCI, or Meanness. But FFM researchers are studying all of these issues. There are many benefits to having such a research base at one's disposal. For example, there are multiple programs of research aimed at the basic processes underlying the traits within the FFM. Several researchers are studying the basic processes underlying Agreeableness (e.g., Graziano & Tobin, 2002; Meier et al., 2006) and Conscientiousness (e.g., Roberts et al., 2005). Others are examining negative affective traits, including anxiety, depression, and shame or guilt, and how these emotions relate to behavior (e.g., Beer, Heerey, Keltner, Scabini, & Knight, 2003). Similarly, the new DSM-5 Section III diagnostic approach for personality disorders depends in large part on the utilization of a pathological variant of the FFM, which allows the substantial existing empirical work on psychopathy from the perspective of the FFM to inform this new diagnostic approach, which is likely to play a pivotal role in the conceptualization and diagnosis of personality pathology for the foreseeable future. Such a connection will enable and encourage researchers to embed the study of psychopathy within the broader framework of personality and personality disorders, rather than working in isolation from these other constructs and literatures.

In general, the ability of an FFM-based approach to connect psychopathy to this broader literature on personality represents one of the greatest strengths of this approach, and constitutes a significant limitation of other trait-based approaches that study psychopathy and its constituent features in relative isolation from this broader literature. Ozer and Reise (1994) suggest that "personality psychologists who continue to employ their preferred measure without locating it within the fivefactor model can only be likened to geographers who issue reports of new lands but refuse to locate them on a map for others to find" (p. 361).

#### NOTE

 The findings regarding competence were the result of experts rating how the psychopath would describe himself, rather than how the experts might describe him. Specifically, experts were asked, "To what degree does the male psychopath *feel* capable, sensible, and effective versus feeling unsure, unprepared, and inept?" (emphasis added).

#### REFERENCES

- Allik, J., & McCrae, R. R. (2004). Toward a geography of personality traits: Patterns of profiles across 36 cultures. *Journal of Cross-Cultural Psychology*, 35, 13–28.
- Allport, G. W. (1937). Personality: A psychological interpretation. New York: Holt.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: Author.
- Andershed, H., Kerr, M., Stattin, H., & Levander, S. (2002). Psychopathic traits in non-referred youths: A new assessment tool. In E. Blaauw & L. Sheridan (Eds.), Psychopaths: Current international perspectives (pp. 131–158). The Hague: Elsevier.
- Barrick, M. R., & Mount, M. K. (1991). The big five personality dimensions and job performance: A metaanalysis. Personnel Psychology, 44, 1–26.
- Beer, J. S., Heerey, E. A., Keltner, D., Scabini, D., & Knight, R. T. (2003). The regulatory function of self-conscious emotion: Insights from patients with orbitofrontal damage. *Journal of Personality and Social Psychology*, 85, 594–604.
- Benning, S. D., Patrick, C. J., Blonigen, D. M., Hicks, B. M., & Iacono, W. G. (2005). Estimating facets of psychopathy from normal personality traits: A step toward community epidemiological investigations. Assessment, 12, 3–18.
- Benning, S. D., Patrick, C. J., Hicks, B. M., Blonigen, D. M., & Krueger, R. F. (2003). Factor structure of the Psychopathic Personality Inventory: Validity and implications for clinical assessment. *Psychological As*sessment, 15, 340–350.
- Blair, R. J. R. (2001). Neurocognitive models of aggression, the antisocial personality disorders and psychopathy. Journal of Neurology, Neurosurgery, and Psychiatry, 71, 727–731.
- Blonigen, D. M., Hicks, B. M., Krueger, R. F., Patrick, C. J., & Iacono, W. G. (2005). Psychopathic personality traits: Heritability and genetic overlap with internalizing and externalizing psychopathology. *Psychological Medicine*, 35, 637–648.
- Bogg, T., & Roberts, B. W. (2004). Conscientiousness and health-related behaviors: A meta-analysis of the leading behavioral contributors to mortality. *Psychological Bulletin*, 130, 887–919.
- Caspi, A., Roberts, B. W., Shiner, R. L. (2005). Personality development: Stability and change. Annual Review of Psychology, 56, 453–484.
- Church, T. A. (2001). Personality measurement in cross-cultural perspective. *Journal of Personality*, 69, 979–1006.
- Cleckley, H. (1988). The mask of sanity. St. Louis, MO: Mosby. (Original work published 1941)
- Costa, P. T., & McCrae, R. R. (1988). Personality in adulthood: A six-year longitudinal of self-reports and spouse ratings on the NEO Personality Inventory. Journal of Personality and Social Psychology, 54, 853–863.

- Costa, P. T., & McCrae, R. R. (1992). Revised NEO Personality Inventory (NEO PIR) and the NEO Five-Factor Inventory (NEOFFI) professional manual. Odessa, FL: Psychological Assessment Resources.
- Costa, P. T., & McCrae, R. R. (1995a). Domains and facets: Hierarchical personality assessment using the revised NEO personality inventory. *Journal of Personality Assessment*, 64, 21–50.
- Costa, P. T., & McCrae, R. R. (1995b). Primary traits of Eysenck's P.E-N model: Three- and five-factor solutions. *Journal of Personality and Social Psychology*, 69, 308–317.
- Crego, C., & Widiger, T. A. (2014). Psychopathy, DSM-5, and a caution. Personality Disorders: Theory, Research, and Treatment, 5, 335–347.
- De Clercq, B., & De Fruyt, F. (2012). A five-factor model framework for understanding childhood personality disorder antecedents. *Journal of Personality*, 80, 1534–1563.
- Decuyper, M., De Pauw, S., De Fruyt, F., De Bolle, M., & De Clerq, B. J. (2009). A meta-analysis of psychopathy-, antisocial PD- and FFM associations. *European Journal of Personality*, 23, 531–565.
- DeNeve, K. M., & Cooper, H. (1998). The happy personality: A meta-analysis of 137 personality traits and subjective well-being. *Psychological Bulletin*, 124, 197–229.
- Derefinko, K. J., & Lynam, D. R. (2006). Convergence and divergence among self-report psychopathy measures: A personality-based approach. *Journal of Per*sonality Disorders, 20, 261–280.
- Derefinko, K. J., & Lynam, D. R. (2007). Using the FFM to conceptualize psychopathy: A test using a drug abusing sample. *Journal of Personality Disorders*, 21, 638–656.
- DeYoung, C. G. (2015). Openness/Intellect: A dimension of personality reflecting cognitive exploration. In M. Mikulincer, P. R. Shaver, M. L. Cooper, & R. J. Larsen (Eds.), APA handbook of personality and social psychology: Personality processes and individual differences (Vol. 4, pp. 369–399). Washington, DC: American Psychological Association.
- DeYoung, C. G., Cicchetti, D., Rogosch, F. A., Gray, J. R., Eastman, M., & Grigorenko, E. L. (2011). Sources of cognitive exploration: Genetic variation in the prefrontal dopamine system predicts Openness/Intellect. Journal of Research in Personality, 45, 364–371.
- DeYoung, C. G., Peterson, J. B., & Higgins, D. M. (2005). Sources of Openness/Intellect: Cognitive and neuropsychological correlates of the fifth factor of personality. *Journal of Personality*, 73, 825–858.
- DeYoung, C. G., Quilty, L. C., Peterson, J. B., & Gray, J. R. (2014). Openness to experience, intellect, and cognitive ability. *Journal of Personality Assessment*, 96, 46–52.
- Digman, J. (1990). Personality structure: Emergence of the five factor model. Annual Review of Psychology, 41, 417–440.
- Eysenck, S. G., & Eysenck, H. J. (1970). Crime and

personality: An empirical study of the three-factor theory. British Journal of Criminology, 10, 225–239.

- Few, L. R., Lynam, D. R., Maples, J. L., MacKillop, J., & Miller, J. D. (2015). Comparing the utility of DSM-5 Section II and III antisocial personality disorder diagnostic approaches for capturing psychopathic traits. Personality Disorders: Theory, Research, and Treatment, 6, 64–74.
- Few, L. R., Miller, J. D., & Lynam, D. R. (2013). An examination of the factor structure of the Elemental Psychopathy Assessment. Personality Disorders: Theory, Research, and Treatment, 4, 247–253.
- Few, L. R., Miller, J. D., Rothbaum, A., Meller, S., Maples, J., Terry, D., et al. (2013). Examination of the Section III DSM-5 diagnostic system for personality disorders in an outpatient clinical sample. *Journal of Abnormal Psychology*, 22, 1057–1069.
- Gaughan, E. T., Miller, J. D., Pryor, L. R., & Lynam, D. R. (2009). Comparing two alternative measures of general personality in the assessment of psychopathy: A test of the NEO PI-R and the MPQ. Journal of Personality, 77, 965–996.
- Graziano, W. G., & Tobin, R. (2002). Agreeableness: Dimension of personality or social desirability artifact? Journal of Personality, 70, 695–727.
- Hare, R. D. (1991). Manual for the Psychopathy Checklist—Revised. Toronto: Multi-Health Systems.
- Hare, R. D. (2003). The Hare Psychopathy Checklist— Revised (2nd ed.). Toronto: Multi-Health Systems.
- Hare, R. D., & Neumann, C. S. (2006). The PCLR assessment of psychopathy: Development, structural properties, and new directions. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 58–88). New York: Guilford Press.
- Hopwood, C. J., Thomas, K. M., Markon, K. E., Wright, A. G. C., & Krueger, R. F. (2012). DSM-5 personality traits and DSM-IV personality disorders. *Journal of Abnormal Psychology*, 121, 424–432.
- Hoyle, R. H., Fejfar, M. C., & Miller, J. D. (2000). Personality and sexual risk taking: A quantitative review. *Journal of Personality*, 68, 1203–1231.
- Hunt, E., Bornovalova, M. A., & Patrick, C. J. (2015). Genetic and environmental overlap between borderline personality disorder triats and psychopathy: Evidence for promotive effects of factor 2 and protective effects of factor 1. *Psychological Medicine*, 45, 1471–1481.
- John, O. P., & Srivastava, S. (1999). The big five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality* (pp. 102–138). New York: Guilford Press.
- Jones, S. E., Miller, J. D., & Lynam, D. R. (2011). Personality, antisocial behavior, and aggression: A meta-analytic review. Journal of Criminal Justice, 39, 329–337.
- Judge, T. A., Bono, J. E., Ilies, R., & Gerhardt, M. W. (2002). Personality and leadership: A qualitative and quantitative review. *Journal of Applied Psychology*, 87, 765–778.
- Judge, T. A., Heller, D., & Mount, M. K. (2002). Five-

factor model of personality and job satisfaction: A meta-analysis. *Journal of Applied Psychology*, 87, 530–541.

- Karpman, B. (1941). On the need of separating psychopathy into two distinct clinical types: The symptomatic and the idiopathic. *Journal of Criminal Psychopathology*, 3, 112–137.
- Karpman, B. (1948). The myth of the psychopathic personality. American Journal of Psychiatry, 104, 523–534.
- Kotov, R., Ruggero, C. J., Krueger, R. F., Watson, D., Yuan, Q., & Zimmerman, M. (2011). New dimensions in the quantitative classification of mental illness. Archives of General Psychiatry, 68, 1003–1011.
- Krueger, R. F. (2013). Personality disorders are the vanguard of the post-DSM-5.0 era. Personality Disorders: Theory, Research, and Treatment, 4, 355–362.
- Lahey, B. B. (2009). Public health significance of neuroticism. American Psychologist, 64, 241–256.
- Levenson, M., Kiehl, K., & Fitzpatrick, C. (1995). Assessing psychopathic attributes in a non-institutionalized population. *Journal of Personality and Social Psychology*, 68, 151–158.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report psychopathy measure of psychopathic personality traits in noncriminal populations. *Journal of Personality As*sessment, 66, 488–524.
- Lilienfeld, S. O., Watts, A. L., Smith, S. F., Berg, J. M., & Latzman, R. D. (2015). Psychopathy deconstructed and reconstructed: Identifying and assembling the personality building blocks of Cleckley's chimera. *Journal of Personality*, 83, 593–610.
- Lilienfeld, S. O., & Widows, M. (2005). Professional manual for the Psychopathic Personality Inventory— Revised (PPI-R R). Lutz, FL: Psychological Assessment Resources.
- Lykken, D. T. (1995). The antisocial personalities. Hillsdale, NJ: Erlbaum.
- Lynam, D. R. (1997). Pursuing the psychopath: Capturing the fledgling psychopath in a nomological net. *Journal of Abnormal Psychology*, 106, 425–438.
- Lynam, D. R. (2012). Assessment of maladaptive variants of Five-Factor Model traits. *Journal of Personality*, 80, 1593–1613.
- Lynam, D. R., Caspi, A., Moffitt, T. E., Raine, A., Loeber, R., & Stouthamer-Loeber, M. (2005). Adolescent psychopathy and the Big Five: Results from two samples. *Journal of Abnormal Child Psychology*, 33, 431–443.
- Lynam, D. R., & Derefinko, K. J. (2006). Psychopathy and personality. In C. J. Patrick (Ed.), *Handbook of the psychopathy* (pp. 133–155). New York: Guilford Press.
- Lynam, D. R., Gaughan, E., Miller, J., Miller, D., Mullins-Sweatt, S., & Widiger, T. (2011). Assessing the basic traits associated with psychopathy: Development and validation of the Elemental Psychopathy Assessment. *Psychological Assessment*, 23, 108–124.
- Lynam, D. R., & Miller, J. D. (2015). Psychopathy from

a basic trait perspective: The utility of a five-factor model approach. *Journal of Personality*, 83, 611–626.

- Lynam, D. R., Sherman, E. D., Samuel, D., Miller, J. D., Few, L. R., & Widiger, T. A. (2013). Development of a short form of the Elemental Psychopathy Assessment. Assessment, 20, 659–669.
- Lynam, D. R., & Widiger, T. A. (2001). Using the fivefactor model to represent the DSM-IV personality disorders: An expert consensus approach. *Journal of Abnormal Psychology*, 110, 401–412.
- Lynam, D. R., & Widiger, T. A. (2007a). Using a general model of personality to identify the basic elements of psychopathy. *Journal of Personality Disorders*, 21, 160–178.
- Lynam, D. R., & Widiger, T. A. (2007b). Using a general model of personality to understand sex differences in the personality disorders. *Journal of Personality Disorders*, 21, 583–602.
- Malouff, J. M., Thorsteinsson, E. B., & Schutte, N. S. (2005). The relationship between the five-factor model of personality and symptoms of clinical disorders: A meta-analysis. Journal of Psychopathology and Behavioral Assessment, 27, 101–114.
- Malouff, J. M., Thorsteinsson, E. B., & Schutte, N. S., Bhullar, N., & Rooke, S. E. (2010). The five-factor model of personality and relationship satisfaction of intimate partners: A meta-analysis. *Journal of Re*search in Personality, 44, 124–127.
- Markon, K. E., Krueger, R. F., & Watson, D. (2005). Delineating the structure of normal and abnormal personality: An integrative hierarchical approach. *Journal of Personality and Social Psychology*, 88, 139–157.
- McCord, W., & McCord, J. (1964). The psychopath: An essay on the criminal mind. Princeton, NJ: Van Nostrand.
- McCrae, R. R., Martin, T. A., & Costa, P. T., Jr. (2005). Age trends and age norms for the NEO Personality Inventory–3 in adolescents and adults. Assessment, 12, 363–373.
- Meier, B., Robinson, M., & Wilkowski, B. M. (2006). Turning the other cheek: Agreeableness and the regulation of aggression-related primes. *Psychological Science*, 17, 136–142.
- Meier, B., Robinson, M., & Wilkowski, B. M. (2007). Aggressive primes activate hostile information in memory: Who is most susceptible? *Basic and Applied Social Psychology*, 29, 23–34.
- Miller, J. D., Gaughan, E. T., Maples, J., Gentile, B., Lynam, D. R., & Widiger, T. A. (2011). Examining the construct validity of the Elemental Psychopathy Assessment. Assessment, 18, 106–114.
- Miller, J. D., Gentile, B., Wilson, L., & Campbell, W. K. (2013). Grandiose and vulnerable narcissism and the DSM-5 pathological personality trait model. *Journal* of Personality Assessment, 95, 284–290.
- Miller, J. D., Hyatt, C. S., Rausher, S., Maples, J., & Zeichner, A. (2014). A test of the construct validity of the Elemental Psychopathy Assessment scores in a community sample of adults. *Psychological Assessment*, 26, 555–562.

- Miller, J. D., Jones, S. E., & Lynam, D. R. (2011). Psychopathic traits from the perspective of self and informant reports: Is there evidence for a lack of insight? *Journal of Abnormal Psychology*, 120, 758–764.
- Miller, J. D., & Lynam, D. R. (2001). Structural models of personality and their relation to antisocial behavior: A meta-analytic review. *Criminology*, 39, 765–792.
- Miller, J. D., & Lynam, D. R. (2003). Psychopathy and the Five Factor Model of personality: A replication and extension. *Journal of Personality Assessment*, 81, 168–178.
- Miller, J. D., & Lynam, D. R. (2013). Missed opportunities in the DSM-5 Section III personality disorder model. Personality Disorders: Theory, Research, and Treatment, 4, 365–366.
- Miller, J., Lynam, D., Widiger, T., & Leukefeld, C. (2001). Personality disorders as extreme variants of common personality dimensions: Can the five factor model adequately represent psychopathy? *Journal of Personality*, 69, 253–276.
- Naragon-Gainey, K., Watson, D., & Markon, K. E. (2009). Differential relations of depression and social anxiety symptoms to the facets of extraversion/positive emotionality. *Journal of Abnormal Psychology*, 118, 299–310.
- Newman, J. P. (1998). Psychopathy: An information processing perspective. In D. J. Cooke, A. E. Forth, & R. D. Hare (Eds.), Psychopathy: Theory, research, and implications for society (pp. 81–104). London: Kluwer Academic Press.
- O'Boyle, E. H., Forsyth, D. R., Banks, G. C., Story, P. A., & White, C. D. (2015). A meta-analytic test of redundancy and relative importance of the dark triad and five-factor model of personality. *Journal of Per*sonality, 83, 644–664.
- Ozer, D. J., & Reise, S. P. (1994). Personality assessment. Annual Review of Psychology, 45, 357–388.
- Patrick, C. J. (1994). Emotion and psychopathy: Startling new insights. Psychophysiology, 31, 319–333.
- Patrick, C. J. (2010). Triarchic psychopathy measure (TriPM). Available from www.phenxtoolkit.org/index. php?pageLink\_browse.protocoldetails&id\_121601.
- Patrick, C. J., Bradley, M. M., & Lang, P. J. (1993). Emotion in the criminal psychopath: Startle reflex modulation. *Journal of Abnormal Psychology*, 102, 82–92.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. Development and Psychopathology, 21, 913–938.
- Paulhus, D. L., Hemphill, J. F., & Hare, R. D. (in press). Manual for the Self-Report Psychopathy scale. Toronto: Multi-Health Systems.
- Paulhus, D. L., & Williams, K. M. (2002). The dark triad of personality: Narcissism, Machiavellianism, and psychopathy. *Journal of Research in Personality*, 36, 556–563.
- Poropat, A. E. (2009). A meta-analysis of the five-factor model of personality and academic performance. *Psychological Bulletin*, 135, 322–338.

- Poy, R., Segarra, P., Esteller, Å., López, R., & Moltó, J. (2014). FFM description of the triarchic conceptualization of psychopathy in men and women. *Psychological Assessment*, 26, 69–76.
- Roberts, B. W., Chernyshenko, O. S., Stark, S., & Goldberg, L. R. (2005). The structure of conscientiousness: An empirical investigation based on seven major personality questionnaires. *Personnel Psychol*ogy, 58, 103–139.
- Roberts, B. W., & DelVecchio, W. F. (2000). The rankorder consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin*, 126, 3–25.
- Roberts, B. W., Jackson, J. J., Burger, J., & Trautwein, U. (2009). Conscientiousness and externalizing psychopathology: Overlap, developmental patterns, and etiology of two-related constructs. *Development and Psychopathology*, 21, 871–888.
- Robinson, M. D., Wilkowski, B. M., Meier, B. P., Moeller, S. K., & Fetterman, A. K. (2012). Counting to ten milliseconds: Low-anger, but not high-anger, individuals pause following negative evaluations. *Cognition and Emotion*, 26, 261–281.
- Ross, S. R., Benning, S. D., Patrick, C. J., Thompson, A., & Thurston, A. (2009). Factors of the Psychopathic Personality Inventory criterion-related validity and relationship to the BIS/BAS and five-factor models of personality. Assessment, 16, 71–87.
- Samuel, D. B., & Widiger, T. A. (2008). A meta-analytic review of the relationships between the fivefactor model and DSM-IV-TR personality disorders: A facet level analysis. *Clinical Psychology Review*, 28, 1326–1342.
- Schmitt, D. P., Realo, A., Voracek, M., & Allik, J. (2008). Why can't a man be more like a woman?: Sex differences in Big Five personality traits across 55 cultures. *Journal of Personality and Social Psychol*ogy, 94, 168–182.
- Sherman, E., Lynam, D., & Heyde, B. (2014). Agreeableness accounts for the factor structure of the Youth Psychopathic Traits Inventory. *Journal of Personality Disorders*, 28(2), 262–280.
- Soto, C. J., & John, O. P. (2012). Development of Big Five domains and facets in adulthood: Mean-level age trends and broadly versus narrowly acting mechanisms. *Journal of Personality*, 80, 881–914.
- Strickland, C. M., Drislane, L. E., Lucy, M., Krueger, R. F., & Patrick, C. J. (2013). Characterizing psychopathy using DSM-5 personality traits. Assessment, 20, 327–338.
- Tackett, J., Slobodskaya, H., Mar, R., Deal, J., Halverson, C., Baker, S., et al. (2012). The hierarchical structure of childhood personality in five countries: Continuity from early childhood to early adolescence. *Journal* of *Personality*, 80, 847–879.
- Tellegen, A. (1985). Structures of mood and personality and their relevance to assessing anxiety with an

emphasis on self-report. In A. H. Tuma & J. D. Maser (Eds.), Anxiety and the anxiety disorders (pp. 681– 706). Hillsdale, NJ: Erlbaum.

- Tellegen, A., & Waller, N. (2008). Exploring personality through test construction: Development of the Multidimensional Personality Questionnaire. In G. J. Boyle, G. Matthews, & D. H. Saklofske (Eds.), Handbook of personality theory and testing: Personality measurement and assessment (Vol. 2, pp. 261–292). London: SAGE.
- Tyrer, P. (2013). The classification of personality disorders in ICD11: Implications for forensic psychiatry. *Criminal Behaviour and Mental Health*, 23, 1–5.
- Vachon, D. D., Lynam, D. R., Widiger, T. A., Miller, J. D., McCrae, R. R., & Costa, P. T. (2013). Using basic traits to predict personality disorder prevalence across the lifespan: The example of psychopathy. Psychological Science, 24, 698–705.
- Watson, D., & Clark, L. A. (1997). Extraversion and its positive emotional core. In R. Hogan, J. A. Johnson, & S. R. Briggs (Eds.), *Handbook of personality psychol*ogy (pp. 767–793). San Diego, CA: Academic Press.
- Watson, D., Clark, L. A., & Harkness, A. R. (1994). Structures of personality and their relevance to psychopathology. *Journal of Abnormal Psychology*, 103, 18–31.
- Whiteside, S. P., & Lynam, D. R. (2001). The Five Factor Model and impulsivity: Using a structural model of personality to understand impulsivity. *Personality* and Individual Differences, 30, 669–689.
- Widiger, T. A. (2013). A postmortem and future look at the personality disorders in DSM-5. Personality Disorders: Theory, Research, and Treatment, 4, 382–387.
- Widiger, T. A., & Lynam, D. R. (1998). Psychopathy and the five-factor model of personality. In T. Millon, E. Simonsen, M. Birket-Smith, & R. D. Davis (Eds.), *Psychopathy: Antisocial, criminal, and violent behavior* (pp. 171–187). New York: Guilford Press.
- Wiggins, J. S., & Pincus, A. L. (1992). Personality: Structure and assessment. Annual Review of Psychology, 43, 473–504.
- Williams, K., Paulhus, D., & Hare, R. (2007). Capturing the four-factor structure of psychopathy in college students via self-report. *Journal of Personality Assess*ment, 88, 205–219.
- Wilson, L., Miller, J. D., Zeichner, A., Lynam, D. R., & Widiger, T. A. (2011). An examination of the validity of the Elemental Psychopathy Assessment: Relations with other psychopathy measures, aggression, and externalizing behaviors. Journal of Psychopathology and Behavioral Assessment, 33, 315–322.
- Yamagata, S., Suzuki, A., Ando, J., Ono, Y., Kijima, N., Yoshimura, K., et al. (2006). Is the genetic structure of human personality universal?: A cross-cultural twin study from North America, Europe, and Asia. *Journal of Personality and Social Psychology*, 90, 987– 998.

# CHAPTER 12

# Psychopathy and DSM-5 Psychopathology

THOMAS A. WIDIGER CRISTINA CREGO

The purpose of this chapter is to consider the relationship of psychopathy with disorders included within the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; American Psychiatric Association [APA], 2013). The co-occurrence of one disorder, such as psychopathy, with another disorder is often described as comorbidity (i.e., the comorbid presence of two disorders). The term "comorbidity" made its first appearance in the title or abstract of a psychiatric journal in the early 1980s (Lilienfeld, Waldman, & Israel, 1994), but "with meteoric speed, 'comorbidity' ... emerged as the single most important concept for psychiatric research and practice" (Lewinsohn, 1990, p. ii).

The term "comorbidity" refers to the co-occurrence of independent disorders, each presumably with its own separate etiology, pathology, and treatment implications (Feinstein, 1970). Diagnostic comorbidity is important in part because it is such a pervasive phenomenon. It is a rare psychiatric patient who meets diagnostic criteria for just one disorder (Widiger & Clark, 2000). Diagnostic comorbidity is also important because it is evident that the etiology, course, treatment, and outcome of a disorder are influenced heavily by the presence of comorbid conditions. And, finally, comorbidity is important because the nature and extent of its occurrence are problematic to the conceptualization of mental disorders as distinct clinical conditions (Lilienfeld et al., 1994; Widiger & Clark, 2000). As expressed by the primary authors of DSM-5, "Epidemiologic and clinical studies have shown extremely high rates of comorbidities among the disorders, undermining the hypothesis that the syndromes represent distinct etiologies" (Kupfer, First, & Regier, 2002, p. xviii). Diagnostic co-occurrence can reflect the co-occurrence of independent conditions, overlapping diagnostic criterion sets, or the presence of a common, underlying pathology. This chapter illustrates these possible interpretations with respect to the comorbidity of psychopathy with personality disorders as defined in the DSM, along with other mental disorders.

### **Personality Disorders**

A number of studies have explored the comorbidity and covariation of psychopathy with the personality disorders included within recent DSM editions. The two with which psychopathy has been consistently reported to covary have been antisocial personality disorder and narcissistic personality disorder. Each is discussed in turn.

#### Antisocial Personality Disorder

There has been a considerable body of research on the diagnostic co-occurrence of psychopathy with antisocial personality disorder (ASPD). This research has generally suggested that most cases of psychopathy diagnosed within prison or other forensic settings would meet DSM-IV (APA, 2000) criteria for ASPD (which were carried forward into DSM-5; see below), but only about half of the cases of ASPD would meet criteria for psychopathy (Hare, 2003; Hare & Neumann, 2008). There are certainly notable differences between psychopathy, as diagnosed with the Hare Psychopathy Checklist-Revised (PCL-R; Hare, 2003) and the DSM (APA, 1980, 2000) ASPD criterion sets (e.g., Crego & Widiger, 2015; Hare & Neumann, 2008; Lilienfeld, 1994; Rogers, Salekin, Sewell, & Cruise, 2000; Widiger, Corbitt, & Millon, 1992). The source of the differences between these diagnostic conceptions can be traced to the origins of their development.

# Developments Leading to the Emergence of the DSM ASPD Conception

Prior to DSM-III, mental disorder diagnosis was notoriously unreliable, contributing to a failure to obtain replicable findings (Spitzer, Endicott, & Robins, 1978). Credit for resolving this crisis is typically given to researchers from the Washington University at St. Louis, who developed specific and explicit criterion sets for 14 mental disorders, along with a variant of depressive disorder termed "secondary depression" (i.e., Feighner et al., 1972). The Feighner and colleagues (1972) criterion sets had a notable impact on psychiatric research. "The renewed interest in diagnostic reliability in the early 1970s—substantially influenced by the Feighner criteria-proved to be a critical corrective and was instrumental in the renaissance of psychiatric research witnessed in the subsequent decades" (Kendler, Muñoz, & Murphy, 2010, p. 141). The development of the DSM third edition (DSM-III; APA, 1980) was influenced heavily by Feighner and colleagues (Spitzer, Williams, & Skodol, 1980).

The sole personality disorder included within Feighner and colleagues' (1972) diagnostic system was ASPD, due in large part to the seminal work of psychiatric epidemiologist Lee Robins. Robins (1966) reported findings from a systematic followup study of 524 children who had been seen 30 years previously at a child guidance clinic for juvenile delinquents. In this work, Robins used 19 criteria for her diagnosis of "sociopathy." She preferred the term "sociopathy" over the DSM-I (APA, 1952) antisocial diagnosis "because it resembles the older term 'psychopathic personality' " (p. 79). It was her intention to identify persons who would be considered psychopathic according to Cleckley's (1941/1976) definition: "It is hoped that Cleckley is correct that despite the difficulties in terminology and definition, there is broad agreement on which kinds of patients are psychopaths" (Robins, 1966, p. 79).

Despite her intention of aligning her clinical description with Cleckley's (1941/1976), there were a number of important differences between Robins's 19 diagnostic criteria and those advanced by Cleckley. She did include a number of key Cleckley traits, such as absence of guilt, pathological lying, and the use of aliases, but missing from Robins' list were lack of capacity for shame, egocentricity, failure to accept blame, inability to learn from experience, deficient insight, and inadequate depth of feeling. In addition, her list contained a number of indicants of nonspecific dysfunction, such as alcohol problems (also evident in some of Cleckley's [1941] case descriptions), drug usage, somatic complaints-and suicide attempts (or actual suicide), in notable contrast with Cleckley's criterion of "suicide rarely carried out" (p. 220).

In addition, consistent with the criterion set subsequently developed by Feighner and colleagues (1972), most of Robins' criteria were accompanied by highly specific requirements for their assignment. For example, impulsive behavior required "frequent moving from one city to another, more than one elopement, sudden army enlistments, [or] unprovoked desertion of home"; poor marital history required "two or more divorces, marriage to wife with severe behavior problems, repeated separations"; and repeated arrests required "three or more non-traffic arrests" (Robins, 1966, p. 342). The purpose of this specificity was to ensure replicable and reliable assessments. Perhaps the only exception was "lack of guilt," which was inferred on the basis of "interviewer's impression from the way in which patient reports his history" (Robins, 1966, p. 343). Not coincidentally, Robins found this diagnostic feature to be difficult to assess reliably.

#### DSM-III ASPD and Hare's PCL

Robins' (1966) 19-item criterion set was substantially reduced for inclusion within Feighner and colleagues' (1972) diagnostic system. The Feighner and colleagues criteria were subsequently revised for inclusion within the Research Diagnostic Criteria (RDC) system advanced by Spitzer and colleagues (1978) and then revised again for DSM-III (APA, 1980)-which Lee Robins contributed to as a member of the Personality Disorders Work Group. The major innovation of DSM-III was the inclusion of "specific and explicit" criterion sets for diagnoses (Spitzer et al., 1980), with the criterion-based definition of ASPD notably having much more specificity in comparison to the other personality disorders. For example, the DSM-III ASPD criterion pertaining to lack of planfulness or impulsivity (APA, 1980) required a distinct history of either traveling from place to place without specified plans for employment or a clear date when the travel would be completed, or being without a fixed address for one month or more. As a function of this specificity, clinical assessments of DSM-III ASPD proved to be highly reliable, in contrast with the other personality disorders, which continued to be unreliable in the absence of a structured diagnostic interview (Mellsop, Varghese, Joshua, & Hicks, 1982; Spitzer, Forman, & Nee, 1979).

Concurrently with the emergence of DSM-III, however, was the development of the PCL by Hare (1980), who cited Cleckley as his major source of inspiration: "the conceptual framework for the ratings being typified best by Cleckley's (1976) The Mask of Sanity" (p. 111); "We wished to retain the essence of psychopathy embodied in Cleckley's work" (Hare, 1986, p. 15). Hare maintained that the emphasis on specific and explicit criteria used for the DSM-III diagnosis of ASPD was unnecessary. The items of the PCL were more openended (i.e., providing illustrative examples rather than specific requirements), but Hare reported that interrater reliability of PCL assessments was typically above .90. Hare (1980) indicated, for example, that "an undergraduate assistant who had worked for us for only a few weeks was able to use the manual to complete checklists for 71 of the 143 inmates; the correlation between his total score and those of each of the two more experienced investigators was .91 and .95, respectively" (p. 114).

These were indeed very compelling reliability coefficients, even exceeding the reliability that would be obtained for DSM-III ASPD. However, this may reflect in large part the fact that PCL assessments relied substantially on a detailed prison file record (perhaps particularly for Factor 2). Raters were being provided precisely the same historical information, thereby avoiding the elicitation of differing indicators that would commonly occur when different persons interview the same patient. The prison record information was also apparently fairly easy to score for PCL items (again, particularly for Factor 2). Such information was only rarely available for clinicians assessing ASPD in medical centers, hospitals, clinics, or private practice offices, most of whom had to obtain the information solely via an interview. Hare (1980, p. 118) acknowledged, "I'm not sure how useful the [PCL] scale will be for assessing psychopathy in noncriminal populations. . . . It would be difficult to obtain sufficient information to complete them with confidence."

In any case, DSM-III ASPD became a primary foil for the PCL, suggesting to many that validity had been sacrificed for reliability (Frances, 1980; Hare, 1983; Millon, 1981), due to (1) a failure to include all the features of psychopathy identified by Cleckley (1941/1976), such as glib charm, egocentricity, lack of remorse, and lack of empathy, as well as (2) focusing on specific behaviors for the assessment of each diagnostic criterion. "The [PCL] checklist differs from DSM-III in that it also considers personality traits whereas DSM-III focuses almost exclusively on a list of antisocial acts, some of them trivial" (Hare, 1986, p. 21).

The authors of DSM-III-R ASPD responded in part by adding an item pertaining to lack of remorse to the criterion set (Widiger, Frances, Spitzer, & Williams, 1988). However, DSM-III-R continued to require relatively specific behaviors for the attribution of a criterion. For example, endorsement of the criterion of reckless behavior required a history of driving while intoxicated or repeated instances of speeding. This approach to personality disorder assessment contributed to an apparent, if not actual, emphasis on behaviors rather than on core traits of psychopathy.

The authors of DSM-IV intended to shift the diagnosis closer still to the PCL-R and Cleckley's (1941/1976) conception. The development of the DSM-IV personality disorders section included a field trial that compared the reliability and validity of DSM-III-R ASPD with an abbreviated version of the PCL-R developed by Dr. Hare (Widiger et al., 1996). Four sites were sampled, including a prison inmate site (for which Dr. Hare served as principal site investigator), a drug treatment-homeless site (with Dr. Robins as principal site investigator), a psychiatric inpatient site (Dr. M. Zanarini), and a methadone maintenance site (Dr. M. Rutherford). External validators included

clinicians' diagnostic impressions of the patient (at the drug-homeless, methadone maintenance, and inpatient sites), using whatever construct of psychopathy they preferred; criminal history; and self-report measures of empathy, Machiavellianism, perspective taking, antisocial personality, and psychopathy. The primary finding was that the relative validity of ASPD and PCL-R items depended on the site. For example, number of arrests and convictions correlated significantly with both ASPD and psychopathy in the drug-homelessness clinic, the methadone maintenance clinic, and the psychiatric inpatient hospital, but not with ASPD or psychopathy within the prison setting. Items that were unique to the PCL-R (e.g., lacks empathy, inflated and arrogant self-appraisal, and glib, superficial charm) correlated more highly with interviewers' ratings of ASPD and psychopathy within the prison setting, but not within the clinical settings. The PCL-R items that were most predictive of clinicians' impressions of psychopathy within the drug treatment and homelessness sites included adult antisocial behavior. Within the psychiatric inpatient site, the most predictive items were adult antisocial behavior and early behavior problems (along with glibness/superficial charm). In contrast, the most predictive items within the prison site were inflated/arrogant selfappraisal, lack of empathy, irresponsibility, deceitfulness, and glibness/superficial charm (Widiger et al., 1996). In summary, the results of the DSM-IV field trial did not suggest that the items unique to the PCL-R were especially useful for the assessment of psychopathy within traditional mental health settings.

However, a significant revision for DSM-IV that did occur was the removal of much of the behaviorally specific requirements that had been included in Robins (1966), Feighner and colleagues (1972), DSM-III (APA, 1980), and DSM-III-R (APA, 1987). For example, within DSM-IV, the "impulsivity/lack of planning" criterion did not require specific behaviors such as traveling without plans or failing to maintain a fixed residence. Instead, these specific exemplars were included within the text discussion of the manual, along with other potential indicators, as only suggestive illustrations. As a function of this change, the DSM-IV criterion set for ASPD was no longer tied to specific behaviors but was instead much more comparable to the open concept, personality trait approach of the PCL-R. Also included in the text of the DSM-IV manual were the PCL-R based psychopathy criteria evaluated in the field trial (e.g., glib charm, arrogance), noting that these features may be especially indicative of ASPD in settings in which a history of criminal deviance is normative (e.g., correctional and other forensic institutions).

It was the intention of the DSM-5 work group to shift the diagnosis of ASPD even closer to psychopathy. This was explicitly evident in the proposal to change the name from "antisocial" to "antisocial/psychopathic" (Skodol, 2010). However, the primary basis for diagnosing antisocial/ psychopathic personality in the initial proposal for DSM-5 was through a clinician's overall impression of a patient matched to a two-paragraph narrative description of a prototypical case; the source for this description was not the PCL-R (Hare, 2003), but rather the prototype narratives of Westen, Shedler, and Bradley (2006).

However, the prototype narrative proposal was soon withdrawn, due in large part to the questionable empirical support for its reliability and validity (Widiger, 2011; Zimmerman, 2011). It was replaced by a hybrid model, combining deficits in the individual's sense of self and interpersonal relatedness (Bender, Morey, & Skodol, 2011) with maladaptive personality traits from a five-domain dimensional trait model (Skodol et al., 2011). The proposed hybrid criterion set for DSM-5 ASPD consisted of four deficits in self and interpersonal functioning and seven maladaptive personality traits (APA, 2013; Skodol et al., 2011). The seven traits were manipulativeness, deceitfulness, callousness, and hostility from the domain of antagonism, and irresponsibility, impulsivity, and risk-taking from the domain of disinhibition. This initial list of traits aligned very well with the DSM-IV criterion set for ASPD but did not go beyond the DSM-IV criteria to include additional traits unique to psychopathy (Lynam & Vachon, 2012).

However, a psychopathy specifier was eventually added to the ASPD hybrid model. This specifier was included to fully represent the conceptualization of psychopathy provided within the triarchic model of psychopathy formulated by Patrick, Fowles, and Krueger (2009). The triarchic model identifies three constructs considered to be essential to the understanding of psychopathy: boldness, meanness, and disinhibition. Boldness relates closely with the fearless-dominance factor of the Psychopathic Personality Inventory-Revised (PPI-R; Lilienfeld & Widows, 2005). To represent these constructs within the DSM-5 hybrid model, three additional traits from the dimensional trait model were selected: low anxiousness, to capture characteristics of imperturbability and resilience; and high attention-seeking and low social withdrawal, to tap dominant/assertive tendencies.

However, the proposed dimensional trait system for personality disorders, including the hybrid diagnosis for ASPD, was ultimately excluded from the main diagnostic portion (Section II) of DSM-5 by decision of the APA's Board of Trustees. This decision was based largely on the recommendations of the Scientific Review Committee for DSM-5 (Kendler, 2013), whose members were concerned with the empirical support for the proposed revisions, and members of the Clinical and Public Health Review Committee, who were concerned with the proposal's public health care implications (Skodol, Morey, Bender, & Oldham, 2013). As summarized by the Chair and other members of the DSM-5 Personality Disorders Work Group, "the [overall personality disorder] proposal was viewed as not strongly supported by the published research at the time" (Skodol et al., 2013, p. 347). DSM-5, therefore, simply reproduced the DSM-IV criterion sets for the various personality disorders, including ASPD. However, the dimensional trait model, including the hybrid diagnosis for ASPD, was placed in a separate part of the DSM-5 manual, Section III, for emerging measures and models (APA, 2013).

#### Criminality

The relationship of criminality to psychopathy warrants particular consideration, as the extent to which psychopathy should be diagnosed on the basis of criminal and/or antisocial behavior has been hotly debated (Cooke & Michie, 2001; Hare & Neumann, 2008, 2010; Skeem & Cooke, 2010). A long-standing criticism of the DSM-III through DSM-IV ASPD diagnoses is that they included too much emphasis on criminal behavior. Hare (1986), for example, suggested that DSM-III would be unable to identify psychopathic persons who lacked a criminal history because it placed too much emphasis on criminality. "DSM-III has difficulty in identifying individuals who fit the classic picture of psychopathy but who manage to avoid early or formal contact with the criminal justice system" (Hare, 1986, p. 21). This charge is somewhat ironic, as Skeem and Cooke (2010) eventually suggested that the PCL-R suffers from the same limitation by placing too much emphasis on criminal history for its diagnosis: "The two-factor model [of the PCL-R] poorly identifies this 'great majority of psychopaths' who escape contact with the legal system or simply express their psychopathic tendencies in a manner that does not conflict with the law" (p. 435; see also Patrick, Hicks, Nichol, & Krueger, 2007).

The criticism of DSM-III might have been somewhat overstated given that most of the DSM-III diagnostic criteria made no explicit reference to criminal activity (e.g., poor work history, irresponsible parent, relationship infidelity, aggressivity, lack of planning, and financial irresponsibility). Nevertheless, a common finding has been that DSM-III and DSM-III-R ASPD criterion sets identified considerably more persons with ASPD within prison settings than would be identified as psychopathic using the PCL or PCL-R, hereafter referred to as the PCL(-R).

Another common finding has been that ASPD is more closely associated with the second factor of the PCL(-R) than the first (Hare, 2003). Historically, the PCL(-R) has been characterized in terms of two factors. Factor 1 was described as a "selfish, callous, and remorseless use of others" and Factor 2 as a "chronically unstable and antisocial lifestyle" (Hare, 1991, p. 38). Hare and Neumann (2008) now emphasize a four-factor model, but this model is compatible with the original two-factor conception (i.e., the original Factor 1 divides into interpersonal and affective subfactors, or facets; and the original Factor 2 divides into antisocial and lifestyle subfactors).

Preference in the psychopathy literature has been given to Factor 1 of the PCL(-R), which is said to reflect the "traits commonly considered to be fundamental to the construct of psychopathy" (Hare, 1991, p. 38), whereas the second factor has been said to entail simply "social deviance" (p. 38). This was essentially poor news for ASPD given its closer alignment with the second factor (or, in turn, bad news for the second factor, to be so closely aligned with ASPD). For example, Hare (2003) asserted, "Research that uses a DSM diagnosis of [ASPD] taps the social deviance component of psychopathy but misses much of the personality component" (p. 92). However, in defense of Factor 2, it is worth noting that it has been shown to be more useful than Factor 1 in risk assessment, prediction of violence, and criminal recidivism (Corrado, Vincent, Hart, & Cohen, 2004; Leistico, Salekin, DeCoster, & Rogers, 2008), which have long been considered major strengths of the PCL(-R).

As suggested from the DSM-IV ASPD field trial (Widiger et al., 1996), criminal behavior is not a particularly useful indicator of psychopathy within prison settings, the primary setting for the majority of PCL(-R) research. The reason is rather clear, in that criminal behavior is universal within a prison population. In contrast, adult criminal behavior can be more specific to persons who are psychopathic within routine clinical settings. The DSM-IV diagnostic criteria for ASPD were presented within the diagnostic manual in descending order of diagnostic value (Gunderson, 1998), with adult criminal behavior listed first because it was the most useful criterion within general clinical settings (Widiger & Corbitt, 1995).

Criminal behavior has long been closely associated with psychopathy. "The clinical concept of psychopathy is linked inextricably to criminal behavior, and in particular to criminal violence" (Hart, 1998, p. 355; but for an alternative view, see Skeem & Cooke, 2010). Psychopathy is a diagnostic concept that was developed in part to help understand and explain criminal behavior (Blackburn, 1993; Hare, 1996). Many studies have indeed indicated that psychopathy as defined by the PCL(-R) has been successful in identifying a particularly callous, dangerous, and remorseless subset of criminals who repeatedly engage in particularly heinous, brutal, and exploitative acts (Hare, Neumann, & Widiger, 2012). Persons high in PCL(-R) psychopathy begin their criminal careers earlier, commit a greater variety of offenses, and offend at higher rates (Hart & Hare, 1997). PCL(-R) scores are associated with higher rates of violent crime and with a higher risk of criminal recidivism (Salekin, Rogers, & Sewell, 1996). The PCL-R often provides incremental validity in the prediction of violence, recidivism, and institutional misbehavior over standard actuarial risk scales based on other demographic and historical variables (Hare, 2003). In summary, psychopathy as assessed by the PCL(-R) does appear to be an important moderating variable in the understanding of a particular subset of physically abusive and violent males, including those who engage in sexual assault, pedophilia, other forms of sexual abuse, and serial murder (Hare, 2003; Hare, Cooke, & Hart, 1999; Meloy, 2002; Porter & Porter, 2007; Stone, 1998; Vitacco, Neumann, & Caldwell, 2010).

As noted by Patrick (2006), "without exception, all the individuals represented in [Cleckley's] case histories engage in repeated violations of the lawincluding truancy, vandalism, theft, fraud, forgery, firesetting, drunkenness and disorderly conduct, assault, reckless driving, drug offences, prostitution, and escape" (p. 608). As expressed by Cleckley (1941/1976), "not only is the psychopath undependable, but also in more active ways he cheats, deserts, annoys, brawls, fails, and lies without any apparent compunction" (p. 343). In summary, "there is no question that Cleckley considered persistent antisocial deviance to be characteristic of psychopaths" (Patrick, 2006, p. 608).

However, Patrick also noted that when Cleckley (1941/1976) discussed the diagnostic criterion concerned specifically with antisocial behavior, he indicated that the antisocial behavior was inadequately motivated, aimless, and perhaps even whimsical. Whereas the nonpsychopathic "criminal usually works consistently and with what abilities are at his command toward obtaining his own ends . . . the psychopath very seldom takes much advantage of what he gains and almost never works consistently in crime or in anything else to achieve a permanent position of power or wealth or security" (p. 261). Cleckley even suggested that psychopathic individuals are unlikely to commit major crimes, such as murder (Patrick, 2006). However, it does not appear that any current instrument for the assessment of psychopathy excludes the commitment of major crimes, goaloriented crimes, or advantageously self-serving criminal acts. In this regard, current assessments of psychopathic criminal behavior, including the PCL-R, may not be consistent with Cleckley's original conception (Hare & Neumann, 2008; Patrick, 2006).

Indeed, it is conceivable for a psychopathic person not to have any criminal record. One might in fact consider such a person to be a "successful psychopath" (Benning, Venables, & Hall, Chapter 24, this volume; Skeem & Cooke, 2010)-that is, a person with all of the key traits of psychopathy who has managed to avoid imprisonment, criminal investigation, or perhaps even suspicion. Mullins-Sweatt, Glover, Derefinko, Miller, and Widiger (2010) surveyed clinical psychology professors, criminal attorneys, and forensic psychologists, asking them if they had ever personally known a psychopathic person who had been successful in his or her psychopathic endeavors-and if so, to characterize the person using trait descriptors. Persons so identified exhibited the antagonistic traits of deceitfulness, arrogance, manipulativeness, lack of remorse, callousness, and egocentricity, but they were high rather than low in Conscientiousness, which is associated with a number of positive life outcomes (Ozer & Benet-Martinez, 2006). Conversely, studies have also demonstrated a significant negative relationship between Conscientiousness and a history of arrests (e.g., Clower & Bothwell, 2002). The lack of deliberation, rashness, and incompetence that characterizes low Conscientiousness could very well contribute to an increased likelihood of being arrested and convicted for one's criminal behavior.

Although it is not difficult to imagine a psychopathic person without a criminal record or even a criminal history, it is perhaps difficult to imagine a psychopathic person not having a history infused with unethical, predatory, and other disreputable acts. Skeem and Cooke (2010) made a distinction between criminal and antisocial behavior. "Criminal" behavior is sanctioned by the legal system, whereas "antisocial" behavior is more inclusive, involving "behavior that defeats the interests of the social order" (p. 435). "Snakes in suits" (i.e., psychopathic persons in business, law or other white-collar professions; Babiak & Hare, 2006; Babiak, Newmann, & Hare, 2010) may not in fact break many laws, but they significantly bend, massage, and work the rules to an unfair, self-serving advantage. Although Skeem and Cooke (2010) were quite critical of including criminal behavior within an assessment of psychopathy, they did feel that "some antisocial behavior seems inherent to the interpersonal and affective core of psychopathy (e.g., noncriminal manipulative behavior)" (p. 435). Indeed, it is difficult to imagine a person being exploitative, callous, selfish, unremorseful, egocentric, deceitful, and manipulative but not engaging in any meaningful form of unethical and/or antisocial behavior (Hare & Neumann, 2008).

#### Narcissistic Personality Disorder

An additional personality disorder with which psychopathy is often reported to be comorbid is narcissistic personality disorder (Lynam, 2011). Narcissistic personality disorder has a theoretical and clinical literature that is quite independent of PCL(-R) psychopathy (Cain, Pincus, & Ansell, 2008; Cooper, 1998; Gunderson, Ronningstam, & Smith, 1991; Kernberg, 1970; Miller, Widiger, & Campbell, 2010; Pincus & Lukowitsky, 2010). Nevertheless, there have also long been cross-references within the narcissism literature to psychopathy, and vice versa. For example, psychodynamic views of narcissism suggest that many features of psychopathy are apparent in narcissistic persons (Gacono, Meloy, & Berg, 1992; Kernberg, 1998; Perry & Cooper, 1989). Antisocial and psychopathic tendencies are in fact conceptualized as being on a continuum with narcissism, with both involving a motivation to dominate, humiliate, and manipulate others. "Pathological narcissism constitutes a dimension within the field of personality disorders that includes-in order of progressive severity-narcissistic personality disorder, malignant narcissism syndrome, and antisocial personality disorder" (Kernberg, 1998, p. 47). As suggested by Stone (1993), "all commentators on psychopathy . . . allude to the attribute of (pathological) narcissism-whether under the rubric of egocentricity, self-indulgence, or some similar term" (p. 292). He went so far as to suggest that "all psychopathic persons are at the same time narcissistic persons" (p. 292). Kernberg (1970) had similarly stated that "the antisocial personality may be considered a subgroup of the narcissistic personality" (p. 51). Hart and Hare (1998) agreed that there is a close correspondence between psychopathy and narcissism but suggested conversely that "psychopathy can be viewed as a higher-order construct with two distinct, albeit related facets, one of which is very similar to the clinical concept of narcissism" (p. 429).

Lynam (2011) conducted a meta-analysis of psychopathy-narcissism research, indicating that the strength and nature of the relationship depended a good deal on the measure and/or model of both constructs. When the PCL-R was used as the measure of psychopathy, narcissism (no matter what measure was used) related about the same (.28 to .34) with both Factor 1 and Factor 2-whereas ASPD was associated much more strongly with Factor 2. However, when the PPI-R (Lilienfeld & Widows, 2005) was used as the measure of psychopathy, quite distinct findings were obtained. DSM-IV narcissistic personality disorder was uncorrelated with PPI-R Fearless Dominance but did correlate well with PPI-R Impulsive Antisociality. When the Narcissistic Personality Inventory (Raskin & Terry, 1988) was used as the measure, narcissism was strongly correlated with Fearless Dominance and largely uncorrelated with Impulsive Antisociality.

Some of the features of DSM-IV (now DSM-5) narcissistic personality disorder are explicitly suggestive of psychopathy, notably, a grandiose sense of self-importance and arrogant, haughty behaviors (akin to psychopathic arrogant self-appraisal); lack of empathy, or being unwilling to recognize or identify with the feelings and needs of others (closely related to psychopathic lack of empathy); and interpersonal exploitation (corresponding to psychopathic manipulativeness, deceitfulness, and antisocial behaviors). It has even been intimated that narcissistic personality disorder is closer to Cleckley's (1941/1976) conception of psychopathy than is ASPD as defined in the DSM (Hare, Hart, & Harpur, 1991; Harpur, Hare, & Hakstian, 1989; Harpur, Hart, & Hare, 2002).

As noted earlier, consideration was given in the development of DSM-IV ASPD to including the features of PCL-R psychopathy that were not already contained within the ASPD criterion set, in particular, glib charm, arrogance, and lack of empathy (Widiger et al., 1992). However, a significant concern with this proposal was that these features are also central to the diagnosis of narcissistic personality disorder. Their inclusion within the criterion set for ASPD would have markedly increased the diagnostic co-occurrence of ASPD with narcissistic personality disorder (Widiger & Corbitt, 1995). The authors of the DSM-IV criterion set for narcissistic personality disorder (Gunderson et al., 1991) considered the antisocial and narcissistic personality disorders to be qualitatively distinct conditions. "The high comorbidity of narcissistic personality disorder with other personality disorders [including especially ASPD] makes differential diagnosis essential" (Ronningstam, 1999, p. 681). The authors of the criterion set for narcissistic personality disorder argued that the revised criteria should increase the ability of clinicians to differentiate between these distinct disorders rather than complicate this effort by increasing criterion set overlap (Gunderson, 1992). As noted earlier, the final decision for DSM-IV was at least to acknowledge that glib charm, arrogance, and lack of empathy are included within other conceptualizations of ASPD, and that their inclusion within the criterion set would likely increase the validity of the assessment of ASPD within prison and other forensic settings (APA, 2000).

To help differentiate the narcissistic and antisocial personality disorders, it has been suggested that "narcissists are usually more grandiose, while ASPD patients are exploitative, have a superficial value system, and are involved in recurrent antisocial activities" (Ronningstam, 1999, p. 681). It is also suggested that "exploitiveness in antisocial patients is probably more likely to be consciously and actively related to materialistic or sexual gain, while exploitive behavior in narcissistic patients is more passive, serving to enhance self-image by attaining praise or power" (p. 681). Elsewhere, Kernberg (1998) suggested that "the way to differentiate . . . narcissistic personality disorder from an antisocial personality disorder proper is the absence in the latter of the capacity for feeling guilt and remorse" (pp. 42-43). Narcissistic persons feel guilty and remorseful when confronted with the negative effects of their exploitative use of others, whereas antisocial persons do not. These speculations are compelling and have perhaps been beneficial in clinical practice, but they have not yet been empirically evaluated.

A compelling rejoinder to the effort to obtain a clear, qualitative distinction between psychopathy and narcissism has been to question "the assumption that these two disorders should be largely independent" (Hare & Hart, 1995, p. 132). Hare and Hart (1995) suggested that authors of the DSM-IV criterion sets should have abandoned the effort to maintain the illusory diagnostic boundaries and place the criterion sets for all the personality disorders, along with the PCL(-R), "into one large pot, to determine whether natural factors or clusters of items would emerge" (p. 133). They speculated that "it is quite possible, even likely, that we would have ended up with a reliable combination of items from several criteria sets-a combination that would have looked a lot like the PCL-R" (p. 133). Factor analyses of personality disorder diagnostic criteria have indeed occurred, but the emergence of a clear PCL(-R) factor has not been the finding (Clark & Livesley, 2002).

As noted earlier, Section III of DSM-5 (APA, 2013) includes a dimensional trait model of maladaptive personality traits organized around five broad domains: negative affectivity, detachment, psychoticism, antagonism, and disinhibition. These domains are said to be aligned with the five domains of the five-factor model of general personality structure (APA, 2013; Krueger & Markon, 2014), consisting of Neuroticism, Extraversion (vs. introversion), Openness, Agreeableness (vs. antagonism), and Conscientiousness. The features of ASPD, narcissism, and psychopathy fall across four of these five domains. ASPD, narcissism, and PCL(-R) psychopathy share many of the same traits of antagonism, such as lack of empathy, arrogance, grandiosity, exploitativeness, and manipulativeness (Lynam & Vachon, 2012; Lynam & Widiger, 2001, 2007; Widiger & Lynam, 1998). Psychopathy and narcissism may also share a facet of low Neuroticism (i.e., low self-consciousness or glib charm) and perhaps also traits of Extraversion (e.g., domination, authoritativeness, and perhaps excitement seeking). However, one key distinction is that ASPD and psychopathy include traits of disinhibition or low Conscientiousness, such as unreliability, irresponsibility, laxness, and rashness, whereas narcissism includes traits of high Conscientiousness, such as achievement striving and acclaim seeking. In this regard, successful psychopathy may resemble narcissism through the presence of traits of high Conscientiousness (Mullins-Sweatt et al., 2010).

#### **Externalizing and Internalizing Disorders**

There has been a considerable amount of research on the comorbidity of psychopathology, leading to the recognition of two broad domains termed "internalizing" and "externalizing" disorders (Achenbach, 1966; Achenbach & Edelbrock, 1978; Krueger & Markon, 2006), along with perhaps a third, thought disorder domain (Kotov et al., 2011). We discuss in turn the relationships of psychopathy with the domains of externalizing and internalizing.

#### Externalizing Disorders

ASPD and substance use disorder are distinct conditions within the American Psychiatric Association diagnostic manual, but their comorbidity is substantial (Ellingson, Littlefield, Vergés, & Sher, Chapter 26, this volume). Smith and Newman (1990) reported that 93% of a sample of incarcerated psychopaths met criteria for alcohol dependence or abuse (26% for opioid dependence or abuse). In the initial National Institute of Mental Health Epidemiologic Catchment Area study, 84% of persons diagnosed with ASPD reported at least some form of substance use disorder (Robins, Tipp, & Przybeck, 1991). A similar high rate of comorbidity was evident in the more recent National Epidemiologic Survey on Alcohol and Related Conditions (Goldstein et al., 2007; Grant et al., 2004).

This comorbidity reflects in part the impact of reckless and/or impulsive substance usage on assessment of ASPD or psychopathy. Alcohol and/ or drug use have often been part of the diagnostic criteria for ASPD and/or psychopathy. For example, driving while intoxicated is listed as a potential indicator of the "reckless disregard" criterion for ASPD in the DSM, and one of Cleckley's (1941/1976) criteria for psychopathy was fantastic and uninviting behavior with drink. Additionally, many other behaviors that would count toward a diagnosis of ASPD and/or psychopathy—such as thefts, deception, conning, poor work history, and recklessness-may be due, at least in part, to a history of dyscontrolled drug usage. In the development of DSM-III, DSM-III-R, and DSM-IV, it was suggested that an exclusion criterion be added to ASPD to disallow the diagnosis when the behaviors involved substance usage (Widiger & Corbitt, 1995). However, this exclusion criterion was never added because differentiation between ASPD and substance dependence is facilitated by the requirement in DSM-IV for evidence of early conduct disorder. The presence of conduct disorder prior to the age of 15 often indicates the onset of ASPD prior to the onset of a substance-related disorder, which makes it unlikely that the adult antisocial acts involving substance-related behavior are secondary to an adult substance-related disorder. The PCL(-R) includes two similar diagnostic criteria (i.e., early behavior problems and juvenile delinquency), but, in contrast to DSM-IV, the PCL(-R) does not require the childhood antecedents to be evident for the diagnosis of psychopathy (Hare, 2003).

Differentiation between ASPD and substance use disorder is more complicated if the onset and course of the substance usage are congruent with the onset and course of the ASPD behaviors. However, if both were evident prior to the age of 15 and persist thereafter into adulthood, it may then be clinically meaningless to differentiate them. Both disorders would likely be present. Persons with ASPD can develop a substance use disorder, and a substance use disorder can contribute to the development of ASPD (Sher & Trull, 1994). In such cases, it might be useful to recognize that both warrant recognition and treatment.

Overlap between the criterion sets for these conditions, however, does not appear to fully explain their extensive diagnostic comorbidity. From the perspective of the cross-cutting domains of internalizing and externalizing disorders, psychopathy and ASPD are both comfortably placed within the domain of externalizing disorders, along with substance and alcohol use disorders, gambling, conduct disorder, and other forms of disinhibitory psychopathology that are also on a continuum with the more general personality traits of low Conscientiousness (i.e., disinhibition) and antagonism (Krueger & Markon, 2006) that predominate in the conceptualization of ASPD and psychopathy (Lynam & Widiger, 2007). In summary, psychopathy, ASPD, substance use disorder, and low Conscientiousness (or low constraint) may all reflect a common, underlying disinhibitory liability. Consistent with this, twin studies have suggested a common genetic basis to ASPD, substance use disorders, and low Conscientiousness (Sher & Slutske, 2003). For example, Krueger and colleagues (2002) reported evidence for this hypothesis in a sample of 1,048 17-year-old twins, concluding: "Our analyses indicated that cooccurrence among alcohol dependence, drug dependence, conduct disorder, adolescent antisocial behavior, and a disinhibitory personality style assessed in late adolescence can be traced to a highly heritable externalizing factor" (p. 419).

Notably, the association between PCL(-R) psychopathy and substance abuse appears to be accounted for largely by Factor 2 of psychopathy (Reardon, Lang, & Patrick, 2002; Smith & Newman, 1990), which has been shown by Patrick and colleagues (2005) to covary closely with the externalizing factor described by Krueger and colleagues (2002). These converging lines of evidence suggest that a disinhibitory disposition or temperament could be the basis for both the irresponsibility, impulsivity, undependability, and negligence of ASPD, and the harmful, reckless, and dyscontrolled drug usage that characterize substance-related disorders.

#### Internalizing Disorders

The relationship of psychopathy to internalizing disorders has been somewhat controversial (Brinkley, Newman, Widiger, & Lynam, 2004; Hare & Neumann, 2008; Schmitt & Newman, 1999). Cleckley (1941/1976) included within his original criteria for psychopathy an "absence of 'nervousness' or psychoneurotic manifestations" (p. 206). Rather than being troubled by the presence of anxiety disorders, Cleckey suggested that "it is highly typical for [psychopaths] not only to escape the abnormal anxiety and tension . . . but also to show a relative immunity from such anxiety and worry as might be judged normal or appropriate" (p. 206). Miller, Lynam, Widiger, and Leukefeld (2001) surveyed 15 psychopathy researchers, asking them to describe the prototypical psychopath in terms of the domains and facets of the FFM. Their description included very low levels of anxiousness, as well as low vulnerability. Miller and colleagues concluded that "the additional neuroticism facet of low vulnerability included by the experts . . . captures the fearlessness of psychopathy emphasized by Lykken (1995)" (p. 270). Kreis, Cooke, Michie, Hoff, and Logan (2012) surveyed 132 mental health professionals with expertise in psychopathy, asking them to indicate the prototypicality of 33 potential traits of psychopathy. Twenty-five traits were considered to be descriptive, including low anxiety and a sense of invulnerability.

However, inconsistent with this literature, PCL(-R) psychopathy has not included low anxiousness within its criterion set (Hare, 2003). Hare and Neumann (2008) suggest that Cleckley was "unclear and inconsistent concerning the definition and role of the [absence of nervousness] item" (p. 228). Many researchers have recommended adding low anxiousness, along with meeting a diagnostic threshold on the PCL(-R), to optimally identify persons with psychopathy (Brinkley et al., 2004; Lykken, 1995; Newman, 1998; Rogers, 1995; Salekin, Rogers, & Machin, 2001; Schmitt & Newman, 1999). Neumann, Johansson, and Hare (2013) added to the PCL(-R) items written specifically to provide clinical ratings of low anxiety and fearlessness. A series of confirmatory factor analyses suggested that the low anxiety and fearlessness items could be placed on any one of the four PCL(-R) factors without any reduction in model fit. In addition, structural equation modeling suggested that a PCL(-R) super-ordinate factor was able to account for most of the variance of the low anxiety and fearlessness items. Neumann and colleagues suggest that these findings indicate that "low anxiety and fearlessness may be part of the larger psychopathy construct" (p. 135), intimating perhaps that they did not really need to be added to the PCL(-R) criterion set.

In stark contrast to the proposal that psychopathy involves low anxiousness, the text accompanying the criteria for ASPD in DSM-5 Section II notes that tension, dysphoria, and depressed mood are observed in individuals meeting this diagnosis. It also notes more specifically that persons meeting criteria for ASPD may exhibit comorbid internalizing (anxiety and/or mood) conditions. However, the suggestion in DSM-5 that ASPD is associated with anxiety disorders can be attributed in part to the fact that most ASPD studies occur within clinical populations (Lilienfeld, 1994). Anxiousness is common among persons in treatment for mental disorders. However, anxiety disorders have been reported among persons diagnosed with ASPD in community epidemiological studies (e.g., Robins et al., 1991). Dahl (1998) suggested that "these findings clearly demonstrate that Cleckley (1941) was wrong when he stated that psychopaths did not show manifest anxiety" (p. 298).

It may also be useful to distinguish among fearfulness, fearlessness, anxiousness, and thrill seeking when considering this research (Hare & Neumann, 2008; Lilienfeld, 1994). The opposite of fearfulness would naturally appear to be a fearlessness that some suggest is central to the construct of psychopathy (Lykken, 1995). Persons who are high in fearlessness engage in substantial risk taking, and might then perhaps experience a considerable degree of anxiousness secondary to their producing and encountering highly stressful events (Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999; Lilienfeld, 1994). Because they are overcoming their anxiousness (i.e., fearfulness), perhaps they are well characterized as being truly fearless. The assessment of fearlessness has indeed often used indicators and measures of thrill seeking, sensation seeking, and adventurousness that generally load on the broad personality dimension of (low) constraint rather than the dimension of negative affectivity, which includes anxiousness (Sylvers, Lilienfeld, & LaPrairie, 2011; but see also Kramer, Patrick, Krueger, & Gasperi, 2012). Understood in this manner, fearlessness would not be considered the opposite of anxiousness or fearfulness. However, it is not entirely clear when using such measures whether the thrill-seeking behavior is best understood as reflecting simply an impulsive disinhibition rather than a fearlessness that is the opposite of fearfulness.

More recently developed measures and models of psychopathy have now in fact included low anxiousness and/or fearlessness that are within the domain of (low) Neuroticism rather than (low) constraint. Lilienfeld and Andrews (1996) had suggested that additional personality traits, beyond those assessed by the PCL(-R), may warrant inclusion within an optimal measure and model of psychopathy. Included within their PPI is a scale for the assessment of fearlessness. Factor analyses of the subscales of the PPI and/or PPI-R (Lilienfeld & Widows, 2005) have typically identified two factors: Fearless Dominance and Impulsive Antisociality. Fearless Dominance does not align closely with either factor of the PCL(-R) (Malterer, Lilienfeld, Neumann, & Newman, 2010), but it does align well with boldness as characterized in the triarchic model of psychopathy (Patrick et al., 2009). As noted earlier, the triarchic model describes three constructs considered to be essential to the understanding of psychopathy: Boldness, Meanness, and Disinhibition. Boldness encompasses features of charm, dominance, selfassurance, and persuasiveness (Patrick et al., 2009) and relates strongly to PPI-R Fearless Dominance, conceptually and empirically (Drislane, Patrick, & Arsal, 2014; Sellbom & Phillips, 2013; Stanley, Wygant, & Sellbom, 2013).

Both Fearless Dominance and Boldness also align with the emotional stability factor of the Elemental Psychopathy Assessment (EPA; Lynam et al., 2011), another more recently developed measure of psychopathy based around the five-factor model of personality. The EPA contains 18 scales, including Invulnerability, Unconcern, Self-Contentment, and Self-Assurance. Few, Miller, and Lynam (2013) factor-analyzed the scales of the EPA and identified four higher-order factors of Antagonism, Narcissism, Disinhibition, and Emotional Stability. They reported that the Emotional Stability factor converged strongly with PPI-R Fearless Dominance. Crego and Widiger (2014) found that PPI-R Fearless Dominance, Boldness as assessed by the Triarchic Psychopathy Measure (TriPM; Drislane et al., 2014), and EPA Emotional Stability aligned closely with one another, but not with ASPD as defined in DSM-5 (see also Venables, Hall, & Patrick, 2014) or psychopathy as assessed by the Self-Report Psychopathy Scale-Version III (SRP-III; Paulhus, Neumann, & Hare, in press; but see Drislane et al., 2014). In addition, PPI-R Fearless Dominance, TriPM Boldness, and EPA Emotional Stability correlated substantially with low Neuroticism (PPI-R Fearless Dominance and TriPM also correlated with Extraversion), but not with Antagonism or low Conscientiousnesswhereas, in stark contrast, DSM-IV ASPD and SRP-III psychopathy correlated substantially with Antagonism and low Conscientiousness but not with Neuroticism or Extraversion. In summary, results from this study indicate that ASPD as defined in DSM terms and psychopathy as indexed by the SRP-III (which was developed as a self-report counterpart to the PCL[-R]) are confined largely to externalizing psychopathology (i.e., Antagonism and low Conscientiousness), but that other, more recently developed measures and models of psychopathy include greater representation of low internalizing tendencies (i.e., low Neuroticism).

### Conclusions

Psychopathy, particularly as assessed by the PCL(-R), has established itself as an important clinical construct, especially within forensic–correctional settings. The ability of the PCL(-R) to predict future violence, substance use, and recidivism clearly has implications for making important forensic decisions related to sentencing, conditional release, and institutional placement (Hare & Neumann, 2008). A task of particular importance for future research, however, will be to dismantle the PCL(-R) and the construct of psychopathy to isolate the particular facets or components that account for its predictive validity. This effort could take the form of dismantling psychopathy in terms of more general models of personality functioning (Lynam et al., 2011), or through the use of assessment instruments that do not rely on criminal history for their assessment and that provide subscales for differing components of psychopathy (e.g., Cooke, Hart, Logan, & Michie, 2012; Drislane et al., 2014; Lilienfeld & Widows, 2005; Paulhus et al., in press). It will also be valuable to conduct future research in populations of persons for whom moderate to high levels of psychopathy are likely to be found in the absence of overt criminal behavior (cf. Benning, Venables, & Hall, Chapter 24, this volume).

#### REFERENCES

- Achenbach, T. M. (1966). The classification of children's psychiatric symptoms: A factor-analytic study. *Psychological Monographs: General and Applied*, 80(7), 1–7.
- Achenbach, T. M., & Edelbrock, C. S. (1978). The classification of child psychopathology: A review and analysis of empirical efforts. *Psychological Bulletin*, 85, 1275–1301.
- American Psychiatric Association. (1952). Diagnostic and statistical manual of mental disorders. Washington, DC: Author.
- American Psychiatric Association. (1980). Diagnostic and statistical manual of mental disorders (3rd ed.). Washington, DC: Author.
- American Psychiatric Association. (1987). Diagnostic and statistical manual of mental disorders (3rd ed., rev.). Washington, DC: Author.
- American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: Author.
- American Psychiatric Association. (2000). *Diagnostic* and statistical manual of mental disorders (4th ed., text rev.). Washington, DC: Author.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: Author.
- Babiak, P., & Hare, R. D. (2006). Snakes in suits: When psychopaths go to work. New York: HarperCollins.
- Babiak, P., Neumann, C. S., & Hare, R. D. (2010). Corporate psychopathy: Talking the walk. Behavioral Sciences and the Law, 28, 174–193.

- Bender, D. S., Morey, L. C., & Skodol, A. E. (2011). Toward a model for assessing level of personality functioning in DSM-5: Part 1. A review of theory and methods. *Journal of Personality Assessment*, 93, 332–346.
- Blackburn, R. (1993). The psychology of criminal conduct: Theory, research and practice. Chichester, UK: Wiley.
- Brinkley, C. A., Newman, J. P., Widiger, T. A., & Lynam, D. R. (2004). Two approaches to parsing the heterogeneity of psychopathy. *Clinical Psychology: Science and Practice*, 11, 69–94.
- Cain, N. M., Pincus, A. L., & Ansell, E. B. (2008). Narcissism at the crossroads: Phenotypic description of pathological narcissism across clinical theory, social/ personality psychology, and psychiatric diagnosis. *Clinical Psychology Review*, 28, 638–656.
- Clark, L. A., & Livesley, W. J. (2002). Two approaches to identifying the dimensions of personality disorder: Convergence on the five-factor model. In P. T. Costa & T. A. Widiger (Eds.), Personality disorders and the five-factor model of personality (2nd ed., pp. 161–176). Washington, DC: American Psychological Association.
- Cleckley, H. (1976). *The mask of sanity* (5th ed.). St. Louis, MO: Mosby. (Original work published 1941)
- Clower, C. E., & Bothwell, R. K. (2002). An exploratory study of the relationship between the Big Five and inmate recidivism. *Journal of Research in Personality*, 35, 231–237.
- Cooke, D. J., Hart, S. D., Logan, C., & Michie, C. (2012). Explicating the construct of psychopathy: Development and validation of a conceptual model, the Comprehensive Assessment of Psychopathic Personality (CAPP). International Journal of Forensic Mental Health, 11, 242–252.
- Cooke, D. J., & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment*, 13, 171–188.
- Cooper, A. M. (1998). Further developments in the clinical diagnosis of narcissistic personality disorder. In E. F. Ronningstam (Ed.), *Disorders of narcissism: Diagnostic, clinical, and empirical implications* (pp. 53– 74). Washington, DC: American Psychiatric Press.
- Corrado, R. R., Vincent, G. M., Hart, S. D., & Cohen, I. M. (2004). Predictive validity of the Psychopathy Checklist: Youth Version for general and violent recidivism. Behavioral Sciences and the Law, 22, 5–22.
- Crego, C., & Widiger, T. A. (2014). Psychopathy, DSM-5, and a caution. Personality Disorders: Theory, Research, and Treatment, 5, 335–347.
- Crego, C., & Widiger, T. A. (2015). Psychopathy and the DSM. Journal of Personality, 83, 665–677.
- Dahl, A. A. (1998). Psychopathy and psychiatric comorbidity. In T. Millon, E. Simonsen, M. Birket-Smith, & R. D. Davis (Eds.), Psychopathy: Antisocial, criminal, and violent behaviors (pp. 292–303). New York: Guilford Press.
- Drislane, L. E., Patrick, C. J., & Arsal, G. (2014). Clarifying the content coverage of differing psychopathy

inventories through reference to the Triarchic Psychopathy Measure. *Psychological Assessment*, 26, 350–362.

- Feighner, J. P., Robins, E., Guze, S. B., Woodruff, R. A., Winokur, G., & Muñoz, R. (1972). Diagnostic criteria for use in psychiatric research. Archives of General Psychiatry, 26, 57–63.
- Feinstein, A. R. (1970). The pre-therapeutic classification of co-morbidity in chronic disease. *Journal of Chronic Diseases*, 23, 455–468.
- Few, L. R., Miller, J. D., & Lynam, D. R. (2013). An examination of the factor structure of the Elemental Psychopathy Assessment. Personality Disorders: Theory, Research, and Treatment, 4, 247–253.
- Frances, A. J. (1980). The DSM-III personality disorders section: A commentary. American Journal of Psychiatry, 137, 1050–1054.
- Frick, P. J., Lilienfeld, S. O., Ellis, M., Loney, B., & Silverthorn, P. (1999). The association between anxiety and psychopathy dimensions in children. *Journal of Abnormal Child Psychology*, 27, 383–392.
- Gacono, C. B., Meloy, J. R., & Berg, J. L. (1992). Object relations, defensive operations, and affective states in narcissistic, antisocial, and borderline personality disorder. *Journal of Personality Assessment*, 59, 32–49.
- Goldstein, R. B., Dawson, D. A., Saha, T. D., Ruan, W. J., Compton, W. M., & Grant, B. F. (2007). Antisocial behavioral syndromes and DSM-IV alcohol use disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. Alcohol and Clinical Experimental Research, 31, 814–828.
- Grant, B. F., Stinson, F. S., Dawson, D. A., Chou, S. P., Ruan, W. J., & Pickering, R. P. (2004). Co-occurrence of 12-month alcohol and drug use disorders and personality disorders in the United States: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. Archives of General Psychiatry, 61, 361–368.
- Gunderson, J. G. (1992). Diagnostic controversies. In A. Tasman & M. B. Riba (Eds.), *Review of psychia*try (Vol. 11, pp. 9–24). Washington, DC: American Psychiatric Press.
- Gunderson, J. G. (1998). DSM-IV personality disorders: Final overview. In T. A. Widiger et al. (Eds.), DSM-IV sourcebook (Vol. 4, pp. 1123–1140). Washington, DC: American Psychiatric Association.
- Gunderson, J. G., Ronningstam, E., & Smith, L. (1991). Narcissistic personality disorder: A review of data on DSM-III-R descriptions. *Journal of Personality Disorders*, 5, 167–177.
- Hare, R. D. (1980). A research scale for the assessment of psychopathy in criminal populations. *Personality* and Individual Differences, 1, 111–117.
- Hare, R. D. (1983). Diagnosis of antisocial personality disorder in two prison populations. *American Journal* of Psychiatry, 140, 887–890.
- Hare, R. D. (1986). Twenty years of experience with the Cleckley psychopath. In W. H. Reid, D. Dorr, J.

I. Walker, & J. W. Bonner, III (Eds.), Unmasking the psychopath (pp. 3–27). New York: Norton.

- Hare, R. D. (1991). The Hare Psychopathy Checklist—Revised manual. North Tonawanda, NY: Multi-Health Systems.
- Hare, R. D. (1996). Psychopathy: A clinical construct whose time has come. Criminal Justice and Behavior, 23, 25–54.
- Hare, R. D. (2003). Hare Psychopathy Checklist—Revised (PCL-R): Technical manual. North Tonawanda, NY: Multi-Health Systems.
- Hare, R. D., Cooke, D. J., & Hart, S. D. (1999). Psychopathy and sadistic personality disorder. In T. Millon, P. H. Blaney, & R. D. Davies (Eds.), Oxford textbook of psychopathology (pp. 555–584). Oxford, UK: Oxford University Press.
- Hare, R. D., & Hart, S. D. (1995). Commentary on antisocial personality disorder: The DSM-IV field trial. In W. J. Livesley (Ed.), *The DSM-IV personality disorders* (pp. 127–134). New York: Guilford Press.
- Hare, R. D., Hart, S. D., & Harpur, T. J. (1991). Psychopathy and the DSM-IV criteria for antisocial personality disorder. *Journal of Abnormal Psychology*, 100, 391–398.
- Hare, R. D., & Neumann, C. S. (2008). Psychopathy as a clinical and empirical construct. Annual Review of Clinical Psychology, 4, 217–246.
- Hare, R. D., & Neumann, C. S. (2010). The role of antisociality in the psychopathy construct: Comment on Skeem and Cooke (2010). *Psychological Assessment*, 22, 446–454.
- Hare, R. D., Neumann, C. S., & Widiger, T. A. (2012). Psychopathy. In T. A. Widiger (Ed.), Oxford handbook of personality disorder (pp. 478–504). New York: Oxford University Press.
- Harpur, T. J., Hare, R. D., & Hakstian, A. R. (1989). Two-factor conceptualization of psychopathy: Construct validity and assessment implications. *Psychological Assessment*, 2, 338–341.
- Harpur, T. J., Hart, S. D., & Hare, R. D. (2002). Personality of the psychopath. In P. T. Costa & T. A. Widiger (Eds.), *Personality disorders and the five factor model of personality* (2nd ed., pp. 299–324). Washington, DC: American Psychological Association.
- Hart, S. D. (1998). Psychopathy and risk for violence. In D. J. Cooke, A. E. Forth, & R. D. Hare (Eds.), Psychopathy: theory, research, and implications for society (pp. 355–373). Dordrecht, The Netherlands: Kluwer Academic.
- Hart, S. D., & Hare, R. D. (1997). Psychopathy: Assessment and association with criminal conduct. In D. M. Stoff, J. Maser, & J. Breiling (Eds.), *Handbook of antisocial behavior* (pp. 22–35). New York: Wiley.
- Hart, S. D., & Hare, R. D. (1998). Association between psychopathy and narcissism: Theoretical reviews and empirical evidence. In E. F. Ronningstam (Ed.), Disorders of narcissism: Diagnostic, clinical, and empirical implications (pp. 415–436). Washington, DC: American Psychiatric Press.

- Kendler, K. S. (2013). A history of the DSM-5 scientific review committee. Psychological Medicine, 43, 1793–1800.
- Kendler, K., Muñoz, R. A., & Murphy, G. (2010). The development of the Feighner criteria: A historical perspective. American Journal of Psychiatry, 167, 134–142.
- Kernberg, O. F. (1970). Factors in the treatment of narcissistic personalities. Journal of the American Psychoanalytic Association, 18, 51–85.
- Kernberg, O. F. (1998). Pathological narcissism and narcissistic personality disorder: Theoretical background and diagnostic classification. In E. F. Ronningstam (Ed.), Disorders of narcissism: Diagnostic, clinical, and empirical implications (pp. 29–52). Washington, DC: American Psychiatric Press.
- Kotov, R., Ruggero, C. J., Krueger, R. F., Watson, D., Yuan, Q., & Zimmerman, M. (2011). New dimensions in the quantitative classification of mental illness. *Archives of General Psychiatry*, 68(10), 1003–1011.
- Kramer, M. D., Patrick, C. J., Krueger, R. F., & Gasperi, M. (2012). Delineating physiological defensive reactivity in the domain of self-report: Phenotypic and etiologic structure of dispositional fear. *Psychological Medicine*, 42, 1305–1320.
- Kreis, M. K. F., Cooke, D. J., Michie, C., Hoff, H. A., & Logan, C. (2012). The Comprehensive Assessment of Psychopathic Personality (CAPP): Content validation using prototypical analysis. *Journal of Personality Disorders*, 26, 402–413.
- Krueger, R. F., Hicks, B. M., Patrick, C. J., Carlson, S. R., Iacono, W. G., & McGue, M. (2002). Etiologic connections among substance dependence, antisocial behavior, and personality: Modeling the externalizing spectrum. *Journal of Abnormal Psychology*, 111, 411–424.
- Krueger, R. F., & Markon, K. E. (2006). Reinterpreting comorbidity: A model-based approach to understanding and classifying psychopathology. Annual Review of Clinical Psychology, 2, 111–133.
- Krueger, R. F., & Markon, K. E. (2014). The role of the DSM-5 personality trait model in moving toward a quantitative and empirically based approach to classifying personality and psychopathology. *Annual Review of Clinical Psychology*, 10, 477–501.
- Kupfer, D. J., First, M. B., & Regier, D. A. (2002). Introduction. In D. J. Kupfer, M. B. First, & D. A. Regier (Eds.), A research agenda for DSM-V (pp. xv–xxiii). Washington, DC: American Psychiatric Association.
- Leistico, A. M. R., Salekin, R. T., DeCoster, J., & Rogers, R. (2008). A large-scale meta-analysis relating the Hare measures of psychopathy to antisocial conduct. Law and Human Behavior, 32, 28–45.
- Lewinsohn, P. M. (1990). Foreword. In J. D. Maser & C. R. Cloninger (Eds.), Comorbidity of mood and anxiety disorders (p. ii). Washington, DC: American Psychiatric Press.
- Lilienfeld, S. O. (1994). Conceptual problems in the as-

sessment of psychopathy. Clinical Psychology Review, 14, 17–38.

- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment*, 66, 488–524.
- Lilienfeld, S. O., Waldman, I. D., & Israel, A. C. (1994). A critical examination of the use of the term "comorbidity" in psychopathology research. *Clinical Psychol*ogy: Science and Practice, 1, 71–83.
- Lilienfeld, S. O., & Widows, M. R. (2005). Psychopathic Personality Inventory—Revised professional manual. Lutz, FL: Psychological Assessment Resources.
- Lykken, D. T. (1995). The antisocial personalities. Hillsdale, NJ: Erlbaum.
- Lynam, D. R. (2011). Psychopathy and narcissism. In W. K. Campbell & J. D. Miller (Eds.), The handbook of narcissism and narcissistic personality disorder (pp. 272–282). New York: Wiley.
- Lynam, D. R., Gaughan, E., Miller, J. D., Miller, D., Mullins-Sweatt, S., & Widiger, T. A. (2011). Assessing the basic traits associated with psychopathy: Development and validation of the Elemental Psychopathy Assessment. Psychological Assessment, 23, 108–124.
- Lynam, D. R., & Vachon, D. D. (2012). Antisocial personality disorder in DSM-5: Missteps and missed opportunities. Personality Disorders: Theory, Research, and Treatment, 3, 483–495.
- Lynam, D. R., & Widiger, T. A. (2001). Using the five factor model to represent the DSM-IV personality disorders: An expert consensus approach. *Journal of Abnormal Psychology*, 110, 401–412.
- Lynam, D. R., & Widiger, T. A. (2007). Using a general model of personality to identify the basic elements of psychopathy. *Journal of Personality Disorders*, 21, 160–178.
- Malterer, M. B., Lilienfeld, S. O., Neumann, C. S., & Newman, J. P. (2010). Concurrent validity of the Psychopathic Personality Inventory with offender and community samples. Assessment, 17, 3–15.
- Mellsop, G., Varghese, F. T. N., Joshua, S., & Hicks, A. (1982). Reliability of Axis II of DSM-III. American Journal of Psychiatry, 139, 1360–1361.
- Meloy, J. R. (2002). The "polymorphously perverse" psychopath: Understanding a strong empirical relationship. Bulletin of the Menninger Clinic, 66, 273–289.
- Miller, J. D., Lynam, D. R., Widiger, T. A., & Leukefeld, C. (2001). Personality disorders as extreme variants of common personality dimensions: Can the Five-Factor Model adequately represent psychopathy? *Journal of Personality*, 69, 253–276.
- Miller, J. D., Widiger, T. A., & Campbell, W. K. (2010). Narcissistic personality disorder and the DSM-V. Journal of Abnormal Psychology, 119, 640–649.
- Millon, T. (1981). Disorders of personality: DSM-III: Axis II. New York: Wiley.
- Mullins-Sweatt, S. N., Glover, N., Derefinko, K. J., Mill-

er, J. D., & Widiger, T. A. (2010). The search for the successful psychopath. *Journal of Research in Personality*, 44, 554–558.

- Neumann, C. S., Johansson, P. T., & Hare, R. D. (2013). The Psychopathy Checklist—Revised (PCL-R), low anxiety, and fearlessness: A structural equation modeling analysis. Personality Disorders: Theory, Research, and Treatment, 4, 129–137.
- Newman, J. P. (1998). Psychopathy: An information processing perspective. In D. J. Cooke, A. E. Forth, & R. D. Hare (Eds.), Psychopathy: Theory, research, and implications for society (pp. 81–104). London: Kluwer Academic.
- Ozer, D. J., & Benet-Martinez, V. (2006). Personality and the prediction of consequential outcomes. Annual Review of Psychology, 57, 401–421.
- Patrick, C. J. (2006). Back to the future: Cleckley as a guide to the next generation of psychopathy research. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 605–617). New York: Guilford Press.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. Development and Psychopathology, 21, 913–938.
- Patrick, C. J., Hicks, B. M., Nichol, P. E., & Krueger, R. F. (2007). A bifactor approach to modeling the structure of the Psychopathy Checklist—Revised. *Journal* of Personality Disorders, 21, 118–141.
- Paulhus, D. L., Neumann, C. S., & Hare, R. D. (in press). Manual for the Self-Report Psychopathy scale. Toronto: Multi-Health System.
- Perry, J. C., & Cooper, A. (1989). An empirical study of defense mechanisms: I. Clinical interview and life vignette ratings. Archives of General Psychiatry, 46, 444–452.
- Pincus, A. L., & Lukowitsky, M. R. (2010). Pathological narcissism and narcissistic personality disorder. Annual Review of Clinical Psychology, 6, 421–446.
- Porter, S., & Porter, S. (2007). Psychopathy and violent crime. In H. Hervé & J. C. Yuille (Eds.), *The psychopath: Theory, research, and practice* (pp. 287–300). Mahwah, NJ: Erlbaum.
- Raskin, R. N., & Terry, H. (1988). A principal-components analysis of the Narcissistic Personality Inventory and further evidence of its construct validity. *Journal of Personality and Social Psychology*, 54, 890– 902.
- Reardon, M. L., Lang, A. R., & Patrick, C. J. (2002). An evaluation of relations among antisocial behavior, psychopathic traits, and alcohol problems in incarcerated men. Alcoholism: Clinical and Experimental Research, 26, 1188–1197.
- Robins, L. N. (1966). Deviant children grown up. Baltimore: Williams & Wilkins.
- Robins, L. N., Tipp, J., & Przybeck, T. (1991). Antisocial personality. In L. N. Robins & D. A. Regier (Eds.), *Psychiatric disorders in America* (pp. 258–290). New York: Free Press.

- Rogers, R. (1995). Diagnostic and structured interviewing: A handbook for psychologists. Odessa, FL: Psychological Assessment Resources.
- Rogers, R., Salekin, R. T., Sewell, K. W., & Cruise, K. R. (2000). Prototypical analysis of antisocial personality disorder: A study of inmate samples. *Criminal Justice and Behavior*, 27, 234–255.
- Ronningstam, E. (1999). Narcissistic personality disorder. In T. Millon, P. H. Blaney, & R. D. Davis (Eds.), Oxford textbook of psychopathology (pp. 674–693). New York: Oxford University Press.
- Salekin, R. T., Rogers, R., & Machin, D. (2001). Psychopathy in youth: Pursuing diagnostic clarity. Journal of Youth and Adolescence, 30, 173–195.
- Salekin, R. T., Rogers, R., & Sewell, K. W. (1996). A review and meta-analysis of the Psychopathy Checklist and Psychopathy Checklist—Revised: Predictive validity of dangerousness. *Clinical Psychology: Science* and Practice, 3, 203–215.
- Schmitt, W. A., & Newman, J. P. (1999). Are all psychopathic individuals low-anxious? *Journal of Abnormal Psychology*, 108, 353–358.
- Sellbom, M., & Phillips, T. R. (2013). Examination of the Triarchic conceptualization of psychopathy in incarcerated and nonincarcerated samples. *Journal of Abnormal Psychology*, 122, 208–214.
- Sher, K. J., & Slutske, W. S. (2003). Disorders of impulse control. In G. Stricker & T. A. Widiger (Eds.), *Handbook of psychology: Clinical psychology* (Vol. 8, pp. 195–228). New York: Wiley.
- Sher, K. J., & Trull, T. J. (1994). Personality and disinhibitory psychopathology: Alcoholism and antisocial personality disorder. *Journal of Abnormal Psychology*, 103, 92–102.
- Skeem, J. L., & Cooke, D. J. (2010). Is criminal behavior a central component of psychopathy?: Conceptual directions for resolving the debate. *Psychological As*sessment, 22, 433–445.
- Skodol, A. E. (2010). Rationale for proposing five specific personality types. Retrieved February 10, 2010, from www.dsm5.org/proposedrevisions/pages/rationaleforproposingfivespecificpersonalitydisordertypes.aspx.
- Skodol, A. E., Bender, D. S., Morey, L. C., Clark, L. A., Oldham, J. M., Alarcon, R. A., et al. (2011). Personality disorder types proposed for DSM-5. *Journal of Personality Disorders*, 25, 136–169.
- Skodol, A. E., Morey, L. C., Bender, D. S., & Oldham, J. M. (2013). The ironic fate of the personality disorders in DSM-5. Personality Disorders: Theory, Research, and Treatment, 4, 342–349.
- Smith, S. S., & Newman, J. P. (1990). Alcohol and drug abuse-dependence disorders in psychopathic and nonpsychopathic criminal offenders. *Journal of Abnormal Psychology*, 99, 430–439.
- Spitzer, R. L., Endicott, J., & Robins, E. (1978). Research diagnostic criteria. Rationale and reliability. Archives of General Psychiatry, 35, 773–782.
- Spitzer, R. L., Forman, J. B. W., & Nee, J. (1979). DSM-

III field trials: I. Initial interrater diagnostic reliability. American Journal of Psychiatry, 136, 815–817.

- Spitzer, R. L., Williams, J. B. W., & Skodol, A. E. (1980). DSM-III: The major achievements and an overview. *American Journal of Psychiatry*, 137, 151–164.
- Stanley, J. H., Wygant, D. B., & Sellbom, M. (2013). Elaborating on the construct validity of the triarchic psychopathy measure in a criminal offender sample. *Journal of Personality Assessment*, 95, 343–350.
- Stone, M. (1993). Abnormalities of personality: Within and beyond the realm of treatment. New York: Norton.
- Stone, M. (1998). Sadistic personality in murderers. In T. Millon, E. Simonsen, M. Birket-Smith, & R. D. Davis (Eds.), Psychopathy: Antisocial, criminal, and violent behaviors (pp. 346–355). New York: Guilford Press.
- Sylvers, P., Lilienfeld, S. O., & LaPrairie, J. L. (2011). Differences between trait fear and trait anxiety: Implications for psychopathology. *Clinical Psychology Review*, 31, 122–137.
- Venables, N. C., Hall, J. R., & Patrick, C. J. (2014). Differentiating psychopathy from antisocial personality disorder: A triarchic model perspective. *Psychological Medicine*, 44, 1005–1013.
- Vitacco, M. J., Neumann, C. S., & Caldwell, M. F. (2010). Predicting antisocial behavior in high-risk male adolescents: Contributions of psychopathy and instrumental violence. *Criminal Justice and Behavior*, 37, 833–846.
- Westen, D., Shedler, J., & Bradley, R. (2006). A prototype approach to personality disorder diagnosis. *American Journal of Psychiatry*, 163, 846–856.

- Widiger, T. A. (2011). A shaky future for personality disorders. Personality Disorders: Theory, Research, and Treatment, 2, 54–67.
- Widiger, T. A., Cadoret, R., Hare, R., Robins, L., Rutherford, M., Zanarini, M., et al. (1996). DSM-IV antisocial personality disorder field trial. *Journal of Abnormal Psychology*, 105, 3–16.
- Widiger, T. A., & Clark, L. A. (2000). Toward DSM-V and the classification of psychopathology. *Psychological Bulletin*, 126, 946–963.
- Widiger, T. A., & Corbitt, E. M. (1995). Antisocial personality disorder in DSM-IV. In W. J. Livesley (Ed.), *The DSM-IV personality disorders* (pp. 103–126). New York: Guilford Press.
- Widiger, T., Corbitt, E., & Millon, T. (1992). Antisocial personality disorder. In A. Tasman & M. Riba (Eds.), *Review of psychiatry* (Vol. 11, pp. 63–79). Washington, DC: American Psychiatric Press.
- Widiger, T., Frances, A., Spitzer, R., & Williams, J. (1988). The DSM-III-R personality disorders: An overview. American Journal of Psychiatry, 145, 786– 795.
- Widiger, T. A., & Lynam, D. R. (1998). Psychopathy from the perspective of the five-factor model of personality. In T. Millon, E. Simonsen, M. Birket-Smith, & R. D. Davis (Eds.), Psychopathy: Antisocial, criminal, and violent behaviors (pp. 171–187). New York: Guilford Press.
- Zimmerman, M. (2011). A critique of the proposed prototype rating system for personality disorders in DSM-5. Journal of Personality Disorders, 25, 206–221.

# CHAPTER 13

# Variants ("Subtypes") of Psychopathy

BRIAN M. HICKS LAURA E. DRISLANE

A common belief among the lay public and scientific researchers is that "psychopathy" refers to a distinct diagnostic category whose defining characteristics distinguish it from even the close construct of antisocial personality disorder (ASPD). As the term is commonly used, however, psychopathy includes a mix of individuals who differ in their interpersonal and behavioral presentation and whose antisocial deviance seems to be a consequence of distinctive etiological processes. Though still underdeveloped as an area of research, the studies on psychopathy subtypes to date provide important pieces of evidence that can help to resolve key questions in the field, including the very definition of psychopathy.

We provide an overview of existing theories of psychopathy subtypes and their distinguishing features, methods to identify psychopathy subtypes, and a review of the more recent empirical literature that provides compelling evidence for psychopathy subtypes. We then review initial evidence that supports conceptualizing psychopathy as a configuration of personality traits that are each indicative of distinct etiological processes, and whose interaction is associated with extreme antisocial deviance. We conclude with a summary of our findings and a discussion of important future directions and how subtypes can help to inform the understanding of psychopathy and antisocial deviance more generally.

# Utility of Variants ("Subtypes") of Psychopathy

The motivation for identifying subtypes is to reduce heterogeneity, that is, to take a large category and sort its members into smaller groups more similar to one another on certain defining features.<sup>1</sup> Key aspects of the utility and validity of a subtype classification are whether it (1) informs etiological processes underlying membership in both the larger and smaller groups, and (2) improves prediction of important outcomes. Ideally, the defining features of subtypes would be directly relevant to etiology, for example, features reflecting emotional or cognitive processes whose neurobiological pathways are well mapped. No such defining features have been established for psychopathy. Therefore, psychopathy subtypes are typically defined by differences on an array of traits and clinical features that we refer to here as "personality structure."

"Personality" has been defined as characteristic ways of acting, thinking, and feeling across differing situations that are relatively stable across time (Tellegen, 1991). Personality includes temperament traits or basic tendencies such as positive and negative emotional reactivity and behavioral control versus disinhibition, as well as more complex attributes termed "characteristic adaptations," reflecting motives, drives, and goals (McAdams & Olson, 2010). The psychometric structure of normal-range personality (i.e., scale measures of trait constructs developed in nonclinical samples) has been well validated, wherein a number of narrower trait constructs (e.g., gregarious, surgent, affiliative) are organized as facets of three to five broader trait dimensions (e.g., Extraversion; Caspi, Roberts, & Shiner, 2005). Substantial research has also been conducted to map the structure of pathological personality traits broadly (i.e., traits related to maladaptation; Krueger & Markon, 2014; Wright & Simms, 2014) and psychopathic traits more specifically (Benning, Patrick, Hicks, Blonigen, & Krueger, 2003; Drislane, Patrick, & Arsal, 2014; Hare & Neumann, 2006; Lynam et al., 2013). As psychopathy is conceptualized as a personality disorder, structural models of personality are well suited to characterize maladaptive patterns of thinking, feeling, and acting that may vary across psychopathic subtypes.

## **Historical Perspectives on Psychopathy**

Perspectives on psychopathy vary, and the scientific study of psychopathy can be organized around two broad conceptualizations of the disorder, with their differences helping to inform findings on psychopathy variants and broader debates on the definition of psychopathy. These themes have been discussed in more detail elsewhere (Patrick, 2006; Patrick, Fowles, & Krueger, 2009; Skeem, Polaschek, Patrick, & Lilienfeld, 2011), and are reiterated here to demonstrate how subtypes are reflected in these alternative perspectives on psychopathy. Both conceptualizations posit that psychopathic individuals have a distinct personality structure that distinguishes them from common criminals, but they differ in the key personality processes that underlie their antisocial deviance.

The first conceptualization is that psychopathy is a paradoxical condition wherein antisocial deviance exists alongside superficial adjustment. This conceptualization is most strongly associated with Hervey Cleckley's (1976) notion of "the mask of sanity," as articulated in his monograph of the same name that reviewed a variety of case studies of psychiatric patients and proposed 16 diagnostic criteria for the disorder. While these psychopathic patients were prolific in their antisocial activities, they tended not to have the particularly malicious or violent traits typically associated with dangerous criminality. Rather, they exhibited a fundamental indifference to the feelings of others as manifest by a lack of guilt, shame, and empathy that Cleckley proposed was a core emotional deficit that operated to maintain their persistent antisocial deviance.

Perhaps the most distinctive aspect of this conceptualization that continues to generate scientific debate is that Cleckley (1976) proposed that psychopathy was associated with a normal and even well-adjusted social presentation. He described psychopathic individuals as having "good intelligence" and a "superficial charm," such that they come off as likable in social interactions. This makes psychopaths especially effective at conning and manipulating others, acting as "wolves in sheep's clothing," such that their deviant nature is only recognized and fully appreciated over time. Also, unlike other psychiatric patients, Cleckley noted that psychopathic individuals had no impairments in reality testing and understood that their conduct violated societal norms. Furthermore, these psychopaths experienced little in the way of ego-dystonic symptoms such as anxiety, depression, or suicidal ideation and behavior. Finally, many of the patients described by Cleckley came from higher socioeconomic status (SES) circumstances, with families that intervened to mitigate the consequences of their antisocial deviance. All of these factors made their antisocial deviance seem irrational or inadequately motivated, suggesting some salient form of mental disorder.

The other major conceptualization of psychopathy is that of a subgroup of serious criminal offenders whose antisocial behavior is more persistent, severe (e.g., more violent), and seemingly sustained by a personality structure of immorality and callous disregard for others, making psychopathy especially resistant to treatment. McCord and McCord (1964) described psychopathy as a condition of "lovelessness" and "guiltlessness," emphasizing an emotional coldness and profound detachment from others, as well as a proneness toward anger and rage-all of which facilitated antisocial deviance that was especially predatory, cruel, and dangerous. This conceptualization is also inherent in much of the childhood psychopathy research that has emphasized callous-unemotional traits as a distinguishing feature of a severe form of conduct disorder associated with greater violence (Frick, Ray, Thornton, & Kahn, 2014). Robins's (1966, 1978) perspective based on longitudinal studies of delinquent youth, which shaped the DSM construct of ASPD, also fits within in this tradition, especially her emphasis away from trait descriptors toward objective behavioral indicators of deviancy, including lying, stealing, destructiveness, and aggression in childhood, and impulsivity, irresponsibility, aggression, and a pattern of criminal behavior in adulthood.

Opinions vary on how well ASPD captures the concept of psychopathy relative to an instrument such as the Psychopathy Checklist-Revised (PCL-R; Hare, 2003). Widiger (2006) contended that the two are merely slightly different operational definitions of the same construct. Others assert that the two approaches identify clearly distinct groups, with the primary criticism of ASPD being that its reliance on behavioral indicators results in the inclusion of a significant proportion of people who do not exhibit a psychopathic personality structure (Hare, 1998). While there is some support for this critique, the ASPD criteria do identify a relatively severe psychiatric condition that has strong personality correlates, most notably high negative emotionality (aggression, alienation, stress reactivity) and low constraint (Krueger, Caspi, Moffitt, Silva, & McGee, 1996). The personality profile associated with ASPD seems to be driven by the small group of people (nearly all men) within the general population whose antisocial behavior exhibits an early onset and persistent course. This subgroup accounts for a disproportionate amount of crime; for example, several studies have found that 5-6% of males in a given population account for roughly 50% of known crimes (Farrington, Ohlin, & Wilson, 1986). Moffitt (1993) dubbed this group the "lifecourse-persistent offenders," and presented evidence that early and persistent antisocial behavior is indicative of a severe form of psychopathology associated with a deviant personality structure (low affiliation, high aggression and alienation) and numerous psychosocial impairments, including high rates of substance use disorders and other mental health problems; childhood disruptive disorders; low SES, parental psychopathology, and harsh parenting; mild neuropsychological deficits; educational, occupational, and financial problems; and drug-related and violent crime, including violence against intimate partners and children (Moffitt & Caspi, 2001; Moffitt, Caspi, Dickson, Silva, & Stanton, 1996; Moffitt, Caspi, Harrington, & Milne, 2002).

There are several notable differences between the severe subtype of ASPD and Cleckley's (1976) conception of psychopathy that suggest differences in etiology. The first is the difference in their social presentation, which can be viewed as a manifestation of more fundamental differences in personality structure. Cleckley's psychopath makes

the impression of being relatively imperturbable—if not normal or even well adjusted—which appears incongruous with antisocial deviance. In contrast, the severe subtype of ASPD conveys an impression of gross psychopathology as evidenced by extreme and obvious personality deviations, comorbid mental health problems, and psychosocial deficits, all of which are more consistent with notions of persistent criminality. Another notable difference is that Cleckley's conception of psychopathy appears to be relatively independent of environmental influences (i.e., it may arise from both higher and lower social classes), whereas the severe subtype of ASPD shows a strong association with lower SES and various other environmental risk factors. This observation lends itself to the hypothesis that Cleckley's psychopathy may be more a consequence of inherited dispositions, while the severe subtype of ASPD is-if not caused bymore strongly associated with environmental deprivation.

It is important to note that the preceding discussion is a historical analysis that proposes that alternative conceptions of psychopathy have resulted in different lines of research that are examining contrasting variants of highly antisocial individuals. Investigators pursuing these differing lines of research, however, do not typically view each other as studying distinct conditions; rather, they tend to view the alternative conceptual approaches as fitting within a broad unitary model of psychopathy. In contrast, some researchers have explicitly conceptualized psychopathy as including subtypes.

# The Primary–Secondary Distinction

Nearly all theoretical models and empirical studies of subtypes have posited a distinction between primary and secondary psychopathy. As the names imply, "primary" psychopathy is meant to denote real psychopathy, whereas the term "secondary" psychopathy is often used to denote a derivative condition that lacks key defining features but shares some characteristics, such as extreme antisocial deviance. In fact, both primary and secondary psychopathy are important clinical constructs for understanding antisocial behavior, though each is defined by a distinct personality structure that reflects different etiological influences. As we will see, there is some evidence to suggest that the alternative Cleckley and severe-ASPD conceptions of psychopathy map onto the primary and secondary distinction.

Karpman (1941, 1948) was the first to propose the primary and secondary distinction, positing that while the two are similar behaviorally, they differ in their motivational structure. Similar to Cleckley (1976), primary psychopathy was conceptualized as resulting from a fundamental affective deficit, entailing lack of conscience and impaired capacity to develop normal attachments, and an affiliated absence of neurotic feelings of guilt or anxiety. Given this lack of conscience, primary psychopaths are motivated by a pathological narcissism that fuels the parasitic exploitation of others. In contrast, secondary psychopathy was conceptualized as entailing a conscience that fails to function appropriately (i.e., an affective disturbance) due to neurotic conflicts (in the psychoanalytic meaning of the concept) that typically are traceable to difficulties in the parent-child relationship or, in the extreme case, child maltreatment. As a consequence of this neurotic disturbance, secondary psychopathy was associated with strong negative emotions, most prominently hostility and aggression, but also guilt, anxiety, and depression. These strong negative emotions were seen as driving a "hot" or reactive and impulsive behavioral style, in contrast to the "cold" and calculated manner in which primary psychopaths exploited others (Karpman, 1955). As a point of contrast between the subtypes, Karpman proposed that secondary psychopathy is amenable to treatment because a basic foundation of conscience is present, whereas the primary variant of psychopathy is not, as there is no affective foundation to work with therapeutically.

Much later, Porter (1996) elaborated on Karpman's theory by proposing that dissociative rather than neurotic mechanisms give rise to an acquired affective disturbance following child maltreatment. The maltreatment initiates a process whereby the child "turns off" the capacity to form emotional bonds through dissociative disengagement, thereby compromising the development of conscience and attendant emotions, such as remorse and empathy, that operate to curb antisocial tendencies. This dissociation and weakening of conscience in turn contributes to an increase in emotional blunting, such that secondary psychopathy eventually resembles primary psychopathy in terms of affective-interpersonal features and antisocial deviance. Within Karpman and Porter's conception, there are several themes that overlap with the modern diagnosis of borderline personality disorder, such as high levels of negative affect (including anxiety and anger), impulsivity, dissociative features, and environmental deprivation (Skodol, Gunderson, et al., 2002; Skodol, Siever, et al., 2002).

Lykken (1957, 1995) proposed that a fearless temperament is the core etiological mechanism that gives rise to primary psychopathy. In support of this theory, he showed that prisoners who resembled the Cleckley (1976) prototype (primary psychopaths) exhibited attenuated autonomic response in a fear conditioning paradigm, increased passive avoidance errors (i.e., greater selection of response options resulting in electric shock) within a learning task, and lower scores on a self-report measure of physical cautiousness relative to a sample of community control participants. Interestingly, Lykken's study also included a comparison group of prisoners labeled "neurotic psychopaths" (akin to secondary psychopaths), who exhibited behavior characteristic of psychopathy but deviated from Cleckley's description in important ways. This "neurotic" (secondary) group was intermediate between primary psychopaths and control participants in terms of fear conditioning, passive avoidance errors, and self-reported harm avoidance, but its members scored higher than controls in self-reported trait anxiety. Lykken (1995) and Fowles (1980, 1993) later elaborated on the fearlessness theory, integrating it with Gray's (1987) neurobehavioral model of motivation and positing that primary psychopathy was due to a weak behavioral inhibition system (BIS)-a brain-based system that underlies sensitivity to punishment cues. In contrast, secondary psychopathy was viewed as reflecting a strong behavioral activation system (BAS), the brain-based circuit responsible for initiating and maintaining reward-seeking and goal-directed behavior. In approach-avoidance situations, both primary and secondary psychopathy would be associated with impulsivity and behavior focused on immediate rewards. Primary psychopathy, however, would not be associated with anxious responding (due to weak BIS), but secondary psychopathy would be associated with high anxiety (due to normal BIS) in the context of frequent entry into approach-avoidance conflict situations (due to a strong BAS). Blackburn (2006) later posited that primary psychopathy is associated with both a weak BIS and a strong BAS, whereas secondary psychopathy is characterized by a strong BIS and BAS.

Blackburn (1975, 1987, 1998) was also one of the first investigators to apply cluster-analytic methods to identify psychopathy subtypes among mentally disordered offenders. His cluster analyses typically identified four subgroups of offenders, two of which he labeled primary and secondary psychopathy. Both of these offender subgroups were aggressive, hostile, and impulsive. However, the two differed on a dimension of interpersonal tendencies termed "withdrawal–sociability," with primary psychopathic offenders presenting as extraverted, dominant, confident, and low anxious, and secondary psychopathic offenders appearing socially withdrawn, lower on self-esteem, moody and anxious, and higher in mental health problems. Blackburn also noted a connection between secondary psychopathy and borderline personality disorder, while primary psychopathy was more aligned with narcissistic personality disorder.

Mealey (1995) advanced an evolutionary psychology analysis of psychopathy in which primary psychopathy reflects a survival strategy that relies on cheating or defecting from groups after signaling cooperation. Based on Mealey's arguments, it follows that the mechanism for this survival strategy is conserved in the human genome and would occur at similar prevalence in all human populations. In contrast, secondary psychopathy reflects an adaption to environments with limited resources. In such situations, there will be a higher incidence of individuals employing a cheating strategy to gain an advantage when competing for resources, and such individuals would be situated disproportionately in the lower SES sector of society, where access to resources is limited. From this perspective, the two subtypes would also differ in terms of personality structure, with secondary psychopathy marked by elevations in aggression and impulsivity, and primary psychopathy characterized by callousness and calculated antisocial deviance.

# Trait-Based Approaches: The PCL-R, Psychopathic Personality Inventory, and Triarchic Psychopathy Measure

While generative, these theories of psychopathy subtypes vary in their empirical support and the extent to which they help to link psychopathy to broader psychological theory. Trait-based approaches, however, have fostered a rich empirical literature that has helped to clarify heterogeneity within psychopathy and link it to other personality and psychopathology constructs. In contrast to prototype approaches that are defined by a configuration of differing attributes, "traits" are coherent constructs that assume a dimensional model of quantitative differences among people. Rather than types of people, traits suggest processes that are common to all people, though individuals differ in their amount or level of the trait (e.g., all people can be measured on height, but some will be tall and others, short). Relative to prototypes, trait models are broader and more flexible constructs, as they are able to characterize all people in quantitative terms. In contrast, many individuals do not fit the description of a prototype because they show weak resemblance to any prototype or possess attributes associated with multiple prototypes. Furthermore, prototypes can be defined as a particular profile of multiple trait constructs.

Three trait-based models of psychopathy have been especially generative in organizing its behavioral and personality features, identifying processes, and helping to inform subtypes. These models are instantiated in the following instruments: the PCL-R (Hare, 2003), the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996), and the Triarchic Psychopathy Measure (TriPM; Patrick et al., 2009). As described by Hare, Neumann, and Mokros (Chapter 3, this volume), the PCL-R is a clinician rating instrument that comprises 20 items reflecting features of psychopathy, completed on the basis of a structured interview and review of collateral file information. It was developed by Hare to serve as an operational definition of Cleckley's conception of psychopathy among prison inmates. Because Hare was interested in criminal offenders, his initial item pool included several items related to early behavioral problems and criminality, in addition to Cleckley's criteria (Hare, 1980). Hare assumed a unitary model of psychopathy, so the process of pruning the initial item pool into the final PCL item set led to the exclusion of most of Cleckley's items related to positive adjustment (because they reduced internal consistency) and to the inclusion of items more explicitly related to criminal behavior (due to higher correlations with traits associated with social deviance; Patrick, 2006).

As a consequence, there was some drift away from the Cleckley prototype, such that the PCL-R appears to index a construct more similar to the severe ASPD-subtype conception of psychopathy. For example, in prisoner samples, the prevalence of ASPD is commonly 50%, whereas the prevalence of prisoners meeting the diagnostic cutoff for psychopathy using the PCL-R is often 25%, with nearly all of the PCL-R–defined psychopaths nested within those who meet criteria for ASPD (Hare, 1996, 2003). Furthermore, structural modeling has estimated a very high correlation (*r* = .92) between the general factor of the PCL-R (i.e., the variance shared among all its items) and a count of total ASPD symptoms (Patrick, Hicks, Nichol, & Krueger, 2007).

Despite the pruning and drifting, significant heterogeneity remains in the PCL-R item set, as demonstrated by its multifactorial structure. Specifically, the PCL-R items form two broad factors, Factor 1 and Factor 2 (Hare et al., 1990; Harpur, Hakstian, & Hare, 1988), that can in turn be parsed into four facets (Hare et al., Chapter 3, this volume). Factor 1 encompasses interpersonal (superficial charm, grandiosity, conning, and lying) and affective (lack of empathy and guilt) features of psychopathy, while Factor 2 is demarcated by items related to impulsivity and a chronically unstable lifestyle, as well as items reflecting overt aggression and criminal behavior. Factor 1 and Factor 2 typically have a correlation of .50.

An interesting aspect of the PCL-R factors is that when their common variance is partialed out (e.g., when both factors are entered as predictors in a multiple regression model), their relations with criterion variables are quite distinct-at times even opposing in directionality-and consistent with descriptions of primary and secondary psychopathy. Factor 2 is positively associated with all facets of negative emotionality (anxiety, distress, depression, anger, aggression), impulsivity, substance use disorders, history of suicide attempts, and environmental risk factors—a pattern consistent with secondary psychopathy (Blonigen et al., 2010; Harpur et al., 1988; Hicks & Patrick, 2006; Patrick, 1994; Smith & Newman, 1990; Verona, Hicks, & Patrick, 2005; Verona, Patrick, & Joiner, 2001). Furthermore, structural modeling work (Patrick, Hicks, Kruger, & Lang, 2005) has shown that Factor 2 is nearly synonymous with the externalizing construct, the highly heritable, nonspecific risk factor that accounts for the high comorbidity among antisocial behavior, substance use disorders, and disinhibited personality traits (Krueger et al., 2002). In contrast, Factor 1 is positively associated with dominance and narcissism, negatively related to most facets of negative emotionality, and exhibits small to negligible associations with impulsivity and anger-aggression, substance use problems, and environmental risk, though many of these associations are only clearly evident after controlling for the variance in Factor 1 that overlaps with Factor 2 (Blonigen et al., 2010; Harpur et al., 1988; Hicks & Patrick, 2006; Patrick, 1994; Smith & Newman, 1990; Verona et al., 2001, 2005).

Regarding the issue of statistical control for shared variance, the PCL-R factors exhibit suppressor effects for certain outcomes-a situation in which the association between a predictor and criterion variable increases (or changes direction) when another predictor variable is included in the prediction model (Paulhus, Robins, Trzesniewski, & Tracy, 2004). Measures of trait anxiety or neuroticism are particularly interesting cases wherein associations with Factor 1 increase from a zero or small negative association to a medium-size negative association after adjusting for scores on Factor 2. In contrast, trait anxiety shows a small to medium positive association with Factor 2 that increases to a medium to large positive association after inclusion of Factor 1 in the predictive model (Blonigen et al., 2010; Hicks & Patrick, 2006). When factors of an instrument are correlated, they are typically interpreted as differing manifestations of a common underlying process. However, when factors exhibit cooperative suppressor effects in opposing directions, the strong implication is that the factors index relatively independent processes. This point is relevant to the issue of psychopathy subtypes because the cooperative suppressor effects observed for facets of negative emotionality such as anxiousness indicate that high PCL-R scorers likely include subgroups that differ in negative emotionality (i.e., low vs. high).

The findings regarding correlates of the PCL-R's two factors dovetail nicely with those for the higher-order factors of the PPI. The PPI (Lilienfeld & Andrews, 1996), a self-report inventory, contains eight scales that coalesce around two factors termed Fearless Dominance and Self-Centered Impulsivity (Lilienfeld & Widows, 2005; alternatively labeled Impulsive Antisociality [Benning et al., 2003). Fearless Dominance encompasses scales indexing social dominance, stress immunity, and fearlessness (similar to Lykken's [1995] conception of primary psychopathy), and shows positive associations with facets of positive emotionality, narcissism, and thrill seeking, and negative associations with facets of negative emotionality and internalizing problems, while minimally related to externalizing problems (Benning et al., 2003; Miller & Lynam, 2012; Patrick, Edens, Poythress, Lilienfeld, & Benning, 2006; but see Blonigen, Hicks, Krueger, Patrick, & Iacono, 2005). Self-Centered Impulsivity encompasses interpersonal aggression, impulsivity, rebelliousness, and blame externalization, and shows positive associations with facets of negative emotionality, internalizing, externalizing, and substance use problems (Benning et al., 2003; Miller & Lynam, 2012; Patrick et al., 2006).

In contrast with the two factors of the PCL-R, scores on the PPI's Fearless Dominance and Self-Centered Impulsivity factors are uncorrelated with one another, indicating that they reflect largely independent processes. However, their nomological networks (i.e., patterns of convergent and discriminant relations with external criteria of various types) are markedly similar to those of the PCL-R factors when researchers control for their shared variance (Benning, Patrick, Blonigen, Hicks, & Iacono, 2005; Poythress et al., 2010). In particular, the nomological network for Fearless Dominance closely resembles that of the interpersonal facet of Factor 1. By contrast, the PCL-R's affective facet appears more similar to the one PPI scale that does not load on either of its factors, the Coldheartedness scale (see Hall et al., 2014), which ostensibly indexes callous and exploitive tendencies associated with adult psychopathy and its counterpart in the child psychopathy literature, callous-unemotional traits (see Frick & Marsee, Chapter 19, this volume).

Patrick and colleagues (2009) proposed a triarchic model of psychopathy that seeks to synthesize multiple theoretical approaches and lines of empirical research in the child and adult psychopathy literatures around three constructs: Boldness, Disinhibition, and Meanness. The construct of boldness as defined by Patrick and colleagues entails high confidence and assertiveness in social situations, along with venturesomeness and resilience to stressors, including the ability to remain calm and focused in dangerous or high-pressure situations. Boldness is intended to reflect the positive adjustment features noted by Cleckley (1976), the link with a fearless temperament proposed by Lykken (1995), and the personality traits assessed by Fearless Dominance.

Disinhibition in the triarchic model reflects the propensity toward impulse control problems associated with externalizing proneness (Krueger et al., 2002; Krueger, Markon, Patrick, Benning, & Kramer, 2007), and includes impairments in planfulness, consideration of consequences, and behavioral control in the context of negative affective experiences and insistent urges. As such, disinhibition manifests as a mix of behavioral impulsivity in the form of irresponsibility, lack of honesty, and poor decision making, resulting in negative consequences, as well as aspects of negative emotionality, including elevated stress reactivity, distrust of others, and angry-reactive aggression. Disinhibition is also associated with substance use problems and other mental health problems such as anxiety, depression, and suicidal behavior. Disinhibition thus reflects mainly features of psychopathy that are assessed by the criteria for ASPD, the items of PCL-R Factor 2 (those comprising its Impulsive– Irresponsible facet, in particular), and the PPI's Self-Centered Impulsivity factor.

Meanness is defined in the triarchic model as entailing a lack of empathy and aggressive social detachment, an orientation referred to as "agentic disaffiliation." Individuals with this orientation dislike and distrust others but seek to dominate and exploit rather than avoid them. Meanness is manifested behaviorally by cruelty to people and animals, premeditated violence, vindictive and destructive aggression, arrogance, and lack of cooperativeness and close attachments to others. Meanness is most clearly evident in PCL-R Factor 1 (in particular, its Affective facet), callous-unemotional traits as assessed by Frick and colleagues' Antisocial Process Screening Device (APSD; Frick & Hare, 2001) and Inventory of Callous–Unemotional Traits (ICU; Essau, Sasagawa, & Frick, 2006), and the construct of disagreeableness emphasized in five-factor model (FFM) conceptions of psychopathy (e.g., Lynam, Miller, & Derefinko, Chapter 11, this volume). In terms of their interrelations, Boldness and Disinhibition are relatively independent, whereas Meanness shows a small to medium association with Boldness and a medium to large association with Disinhibition.

As evidenced by validation studies utilizing the TriPM to operationalize these distinct psychopathy facets, the triarchic model efficiently distills key themes of much of psychopathy research, and thus has substantial descriptive utility for comparing different conceptions of psychopathy based on how prominently Boldness, Disinhibition, and Meanness are represented. Figure 13.1 provides graphic depictions of our impressions of some prominent conceptualizations of psychopathy in triarchic terms. For example, the personality structure of the prototypical or primary psychopath would be defined as having an equal representation of Boldness, Meanness, and Disinhibition. Cleckley (1976) psychopathy comes close to this definition but has a slightly greater representation of Boldness and Disinhibition, and less of Meanness. In contrast, secondary psychopathy and the severe-ASPD subtype conceptions are dominated by Disinhibition, followed by a significant portion of Meanness but little Boldness. PCL-R-defined psychopathy would have a similar profile, but with a slightly greater representation of Boldness and less of Disinhibition. Initial empirical results are consistent with these impressions. For example,
#### ASSESSMENT AND DIAGNOSIS



**FIGURE 13.1.** Schematic depiction of the hypothesized relative contributions of Boldness, Meanness, and Disinhibition to different conceptual models of psychopathy. ASPD, antisocial personality disorder; PCL-R, Psychopathy Checklist—Revised.

Venables, Hall, and Patrick (2014) reported that ASPD symptoms and PCL-R scores both showed associations with Meanness and Disinhibition (indexed using the TriPM), whereas the PCL-R (Factor 1, its interpersonal facet in particular) alone showed an association with Boldness over and above its relations with Disinhibition and Meanness.

#### **Finding Subtypes**

If psychopathy subtypes exist, they should be present in existing datasets and readily identifiable using appropriate methods to detect them. Several analytic techniques-most prominently, cluster analysis-reduce the heterogeneity within a sample by sorting individuals into more homogeneous subgroups using a set of variables on which subtypes differ. It should be noted, however, that reducing heterogeneity by subgrouping is not the same as detecting naturally occurring clusters. For example, a score of 30 on the PCL-R is often used to classify prisoner samples into psychopathic and nonpsychopathic subgroups (Hare, 2003); while this reduces within-sample heterogeneity, it does not typically result in clearly separated groups. Rather, naturally occurring clusters or subgroups should be both internally cohesive and externally isolated (Cormack, 1971); that is, in terms of locating individuals within a multivariate space, there should be areas of high concentration in which individuals cluster together, as well as areas in which there are relatively few individuals, such that within-cluster differences are small relative to between-cluster differences.

#### Analytic Method

Cluster analysis includes a wide variety of methods that can be broadly subdivided into (1) algorithmic methods, and (2) mixture-model clustering analysis (Steinley & Brusco, 2011b). The two approaches differ in that mixture-model clustering analysis uses statistical distributions (e.g., multivariate normal) to identify subgroups within a given dataset (i.e., a mixture of different distributions), whereas algorithmic methods subgroup objects using a computational procedure that is guided by a minimization criterion (e.g., to minimize the within-cluster variance). A consequence of these differences is that cluster assignment in mixture-model clustering is probabilistic (i.e., a posterior probability can be calculated for each object in reference to membership in each cluster) and alternative models can be compared using fit

statistics that index the likelihood that a given model (including one with only a single cluster; i.e., a no-subtypes model) reflects the optimal number of clusters. In contrast, algorithmic approaches always subgroup objects when applied to a dataset; objects are either members or nonmembers of a cluster (i.e., there is no posterior probability associated with cluster membership), and there are no likelihood-based statistics to evaluate the fit of alternative models and determine the optimal number of clusters within the observed data (although non-likelihood-based statistics have been developed for this purpose).

Algorithmic approaches can be further subdivided into hierarchical and nonhierarchical methods. The most common hierarchical methods are agglomerative clustering procedures that begin with each object as a separate cluster, then proceed by combining the most similar two objects as defined by a distance or similarity metric (e.g., squared Euclidean distance). Clustering continues object by object to form larger clusters according to an algorithm or set of rules that determines the order in which objects are to be combined, until only one cluster remains. There are dozens of linkage criteria that can be used for this purpose, such as single-linkage or nearest neighbor clustering (minimum distance between objects of different clusters) and complete-linkage or farthest neighbor clustering (maximum distance between elements of different clusters). Ward's (1963) method is perhaps the most popular and combines objects, such that the resulting within-cluster variance is minimized at each step. A dendrogram (a tree-like diagram) is typically used to illustrate the associations among the objects and the order in which objects were joined into clusters. Determining the number of clusters in a dataset is often accomplished using stopping rules based on a variety of statistics that index changes in within-cluster similarity at each stage of clustering, as well as a visual inspection of the dendogram to identify the stages when relatively large groups are fused. For example, the Calinski and Harabasz (CH; 1974) pseudo-F statistic, a ratio of the between-to-within-cluster variance, provides an index of cluster distinctiveness and has performed well in simulation studies in terms of determining the optimal number of clusters.

Nonhierarchical methods partition a sample into clusters by minimizing or maximizing a numerical criterion, which does not necessarily result in a hierarchical classification structure. The most commonly used nonhierarchical method, *k*means, builds clusters so that the distance between each object and the mean vector of its cluster is as small as possible (Steinley, 2006). Applying this method, cluster assignment operates to minimize the within-cluster variance given a predetermined number of clusters. This is done by first establishing a set of seed points to form initial cluster centroids, that is, the position in multivariate space corresponding to the mean value of each clustering variable for the objects in the cluster. One approach to establishing seed points is to use the clusters identified in a hierarchical procedure as the initial seeds; another is to use a function that incorporates multiple random seed points, which has the advantage of removing any bias (Steinley, 2003). Once initial seeds are established, objects are assigned to clusters based on their distance to these seeds. Cluster centroids are then calculated to replace the initial seeds, and objects are reassigned to the cluster with the nearest centroid. Calculation of new cluster centriods is based on the new cluster membership, and objects are reassigned to further reduce the variance within clusters. The latter two steps are repeated until cluster reassignment no longer reduces the within-cluster variances.

A weakness of the k-means method is that it requires specification of the number of clusters at the outset, making the technique less useful for discovering the number of clusters than for determining cluster membership. Several methods, however, have been developed to establish the number of clusters in a dataset, and some have shown promising cluster recovery capabilities in simulation studies. For example, Steinley and Brusco (2011a) developed a two-step procedure that first tests whether more than one cluster is present, using the theoretical ratio expected between the within-cluster sum of squares and the total sum of squares if the data are divided into two clusters, when in fact no cluster structure is present as a criterion. If there is evidence for more than one cluster, then the next step is to use the CH statistic to determine the optimal number of clusters.

The major alternative to algorithmic methods, mixture-model clustering, uses distributional theory and likelihood methods to evaluate whether the associations among a set of variables can be attributed to the presence of a mixture of populations in the dataset (Lubke & Miller, 2015; Steinley & Brusco, 2011b). Mixture-model clustering can be divided into structural equation modeling and finite mixture modeling approaches. The underlying theory of structural equation models is that a smaller number of latent or unobserved categorical variables can best account for the covariance among a larger set of observed variables. The simplest of these models are latent class analysis (used when the observed variables are categorical) and latent profile analysis (used with continuous observed variables). Membership in one latent class (/profile) or another is then determined by similarity of mean-levels on the observed variables. Both latent class and latent profile analysis assume local independence among the observed variables, which means that the observed variables within each latent class are independent or uncorrelated. Local independence is also an assumption of item response theory (in which a continuous latent variable is presumed to account for the covariance among categorical observed variables) and is equivalent to the case of uncorrelated residual variances among the observed variables in a confirmatory factor analysis model (where a continuous latent variable is presumed to account for the covariance among continuous observed variables). For latent class and latent profile analysis, the consequence of local independence is that each class will have a diagonal covariance matrix (i.e., nonzero variances on the diagonal and zeros in the offdiagonal elements). This is a relatively restrictive assumption that is relaxed in other models called factor mixture models, in which all elements of the within-class covariance matrix may be nonzero and are allowed to differ across classes. The result of this flexibility is that the factor structure can be modeled within each class and can vary across classes, including the number of factors, the factor loadings, and the factor means and variances.

Finite mixture modeling is the other major statistical approach to mixture-model clustering, and includes model-based cluster analysis (MCA; Fraley & Raftery, 2002). Finite mixture modeling tests the hypothesis that given a particular density function or distribution (e.g., multivariate normal), the observed data can best be accounted for by a mixture of populations (i.e., number of clusters) that each account for a certain proportion of cases in the sample. The likelihood function of a given model is typically estimated using the expectation-maximization algorithm, which alternates between (1) estimating the posterior probability of each observation belonging to each cluster given a fixed set of parameters, and (2) obtaining updated estimates of the parameters by fixing the probability of cluster membership for each observation. Because adding parameters often increases the likelihood of a model, fit statistics such as the Bayesian information criterion (BIC; Raftery, 1995) add a penalty to the likelihood function for the number of parameters in the model to balance overall fit and model parsimony for the purpose of identifying the best-fitting model.

MCA typically proceeds by fitting a series of models that differ in the number of clusters and the structure of the within-cluster covariance matrix, which determines the size or volume, shape, and orientation of the clusters in multivariable space. Spherical models require that each cluster have a diagonal covariance matrix and that the diagonal elements (i.e., the variances) are equal. Because each variable has the same variance and all the variables are uncorrelated with each other, the resulting clusters will be the same size and have a spherical shape. Related to size, a cluster that is smaller (i.e., has less volume or variance) represents a more homogeneous group than a larger cluster. k-means is equivalent to the spherical model. Diagonal models remove the constraint that the diagonal elements are equal, though variables are still required to be uncorrelated; that is, variables are allowed to have differing variances within clusters. As a result, clusters will have an elliptical shape. More general MCA models are even less restrictive and allow the variables to be correlated within clusters, so that the clusters now have the property of orientation. Similar to factormixture models, the orientation parameter allows the associations among variables to differ across clusters (i.e., the factor structures are allowed to differ). The most general MCA models allow for the clusters to differ in shape, size, and orientation.

MCA has a number of elegant statistical features, most notably objective fit indices to identify the most appropriate model-among alternatives specifying one or more clusters-and substantial flexibility in defining the contours of clusters. However, few studies have demonstrated the superiority of MCA over algorithmic methods by directly comparing the two in terms of cluster recovery across a range of conditions such as the number of clusters, number of clustering variables, the correlations among variables, nature of cluster overlap, or sample size. In one study of this kind, Steinley and Brusco (2011b) reported results from three simulation studies comparing the performance of MCA to k-means, and found that model-based cluster analysis performed better under some conditions but failed to achieve greater cluster recovery than k-means for a number of other conditions. The most general (i.e., least restrictive) MCA models performed particularly poorly, likely due to these more complex (and potentially overparameterized) models capitalizing on chance variation within the data. Of greatest concern, however, was that under conditions in which the number of clusters was unknown, the combination of MCA and BIC performed poorly in identifying the true cluster structure, and substantially worse than a k-means approach utilizing the CH statistic. However, using MCA and the CH statistic to select the best-fitting model greatly improved performance relative to MCA/BIC and was even slightly better than k-means/CH. Based on these results, Steinley and Brusco (2011b) recommended using a diagonal MCA model that allowed for clusters to differ in their shapes and volumes in conjunction with the CH index to select the number of clusters, and concluded that increased model complexity and flexibility was unlikely to perform better when attempting to uncover unknown cluster membership.

#### **Clustering Variables**

In addition to the analytic method, the results of a cluster analysis also depend on the nature of the clustering variables, which serve to establish the boundaries of the clusters. The within-cluster means for variables form the center of the cluster, while the variances of the variables determine the size and shape of the cluster. To achieve good cluster separation, the variables should exhibit large mean-level differences across clusters. Furthermore, the within-cluster variances for the variables should be small, but relatively large across the full sample to achieve a high ratio of withinto-between-cluster variance.

Because the variance of clustering variables has such a large effect on cluster structure, it has long been recommended that variables be standardized prior to clustering-most typically using z-scores—so that the final cluster solution is not unduly influenced by spurious factors such as scaling differences. However, standardizations such as z-scores that result in all variables having equal variance are problematic because they remove between cluster variance that is crucial to determining cluster structure. This is further complicated by the fact that clustering variables do not contribute equally to defining cluster structure. In fact, variables that contribute little or no clustering information can "mask" or hinder an analytic method's ability to uncover the underlying cluster structure. To avoid these pitfalls, Steinley and Brusco (2008) recommended a scaling procedure that uses the range and variance to put all variables on the same scale, while retaining variance information, so that variables are weighted in terms of their relative contributions to cluster structure. As an additional step, variable selection procedures have also been proposed that use weighting procedures to identify a set of variables that jointly defines cluster structure most efficiently (Steinley & Brusco, 2008).

#### Variable Selection in Psychopathy Subtyping

In terms of choosing variables to use in analyses directed at identifying psychopathy subtypes, our recommendation is to use variables that exhibit the largest *differences* in their associations with psychopathy factor-level constructs assessed in instruments such as the PCL-R and the PPI. This is because factor constructs are an alternative way to organize heterogeneity within the content domain of psychopathy, and so provide substantial information as to where individuals are likely to be located in multivariate space. The PPI factors are especially useful for this task, as their independence makes for straightforward interpretations about their associations with external variables.

Referencing Miller and Lynam's (2012) metaanalysis of the nomological network of the PPI total and factor scores, we found that FFM Neuroticism was the variable that exhibited the greatest difference in its associations with the PPI factors, with weighted average effect sizes for Fearless Dominance of r = -.504 (95% confidence interval [CI]: --.532 to --.474) and for Self-Centered Impulsivity of r = .302 (95% CI: .266 to 0.337). Given these observed associations, we can define a multivariate space in which the PPI factors serve as x- and y-axes, with the most psychopathic individuals falling into the quadrant of high scores on both Fearless Dominance and Self-Centered Impulsivity (see Figure 13.2 for an illustration of a hypothetical example). Neuroticism can then be used to define a third dimension or z-axis. We can now locate two clusters within the high Fearless Dominance/high Self-Centered Impulsivity space anchored at the high and low ends of Neuroticism. This is made possible by the structural associations between Neuroticism and the two PPI factors. Put another way, a person can be high in both Fearless Dominance and Self-Centered Impulsivity, but a person cannot be both low (due to high Fearless Dominance) and high (due to high Self-Centered Impulsivity) in Neuroticism at the same time. Rather, there are two groups within the high Fearless Dominance/high Self-Centered



FIGURE 13.2. Hypothetical example of how inclusion of a variable that exhibits a large difference in its associations with psychopathy factor-level constructs (i.e., Neuroticism) can clarify the location of clusters of individuals with high psychopathy within multivariable space. (a) Scatterplot of scores on the Self-Centered Impulsivity (SCI) and Fearless Dominance (FD) factors of the PPI, which are uncorrelated. The upper right quadrant contains individuals simultaneously scoring high on both SCI and FD dimensions; however, primary (black triangles) and secondary (gray squares) psychopathy variants cannot be distinguished based on SCI and FD scores alone. (b) Scatterplot depicting the inverse association between scores on FD and Neuroticism. More clearly identifiable clusters of primary (black triangles) and secondary (gray squares) psychopathic individuals emerge due to mean-level differences on Neuroticism across the two variants (secondary > primary). However, nonpsychopathic individuals (i.e., those scoring high on FD but not SCI) are also intermixed. (c) Scatterplot depicting the positive correlation between scores on SCI and Neuroticism. Again, more clearly identifiable clusters of primary (black triangles) and secondary (gray squares) psychopathic individuals emerge due to meanlevel differences across variants on Neuroticism. However, nonpsychopathic individuals (i.e., those scoring high on SCI but not FD) are again intermixed. (d) Multidimensional depiction of the associations between SCI (x-axis), FD (y-axis), and Neuroticism (z-axis). Distinct clusters of individuals high on both SCI and FD are distinguished based on their location along the z-axis (Neuroticism). Primary psychopathic individuals (black triangles) are anchored at the low pole of Neuroticism, while secondary psychopathic individuals (gray squares) are anchored at the high pole of Neuroticism.

Impulsivity space that exhibits a large mean difference on Neuroticism. When these high and low Neuroticism groups are collapsed, as in the case of a group with high PPI total scores, the association between Neuroticism and PPI total scores is close to zero, consistent with meta-analytic results (r =--.087; 95% CI: --.139 to -.035).

Cluster boundaries can be refined by including additional variables in the cluster analysis that have similarly large differences in their associations with the psychopathy factor constructs, as long as the added variables provide unique information. Again referring to Miller and Lynam's (2012) meta-analytic results, the constructs that exhibited the largest differences in their associations with the PPI factors were Neuroticism, Negative Emotionality, Borderline Personality Disorder, Broad Internalizing, Extraversion, Anxiety, Positive Emotionality, Impulsivity, and Conscientiousness. There is significant overlap among some of these constructs, but the structure of this list roughly corresponds to the content covered by three-factor models of personality that are organized around relatively independent Negative Emotionality, Positive Emotionality/Extraversion, and Constraint versus Disinhibition constructs. though facet-level measures within these domains may provide additional distinct variance for helping to further refine cluster structure.

#### Base Rate of Psychopathy

Cluster-analytic methods identify clusters that are defined by those variables that account for the most variability across the sample. Therefore, when attempting to identify subtypes of psychopathy, it is important to know the base rate or mean level of psychopathy to inform what variables will maximally differentiate potential subgroups (Lubke & Miller, 2015). Our earlier recommendations for clustering variables are most applicable to samples of individuals high in psychopathy. For samples consisting of such individuals (e.g., all sample members have a high overall score on a measure of psychopathy), the variance of psychopathy facet variables (e.g., scores on subscales or item subsets of the psychopathy measure used to define the highpsychopathy group) will be somewhat restricted and so less useful for defining clusters. Instead, other variables that exhibit large differences in their associations with different psychopathy facet measures account for more variability and so will be better able to define cluster structure. For samples that have relatively high base rates of both high

and low psychopathy individuals such as unselected prisoner samples, psychopathy facet measures (e.g., PCL-R facets) and nonpsychopathy measures (e.g., Neuroticism) will be effective in differentiating multiple groups of high psychopathy individuals. When the base rate of psychopathy is low, as in unselected community samples, it is difficult to differentiate psychopathy subtypes because psychopathy and antisocial behavior are not typically major dimensions of variation; that is, the difference between psychopathic and nonpsychopathic individuals will be much larger relative to the differences within the group of high psychopathic individuals. Thus, it will probably be necessary in general nonoffender (e.g., community) samples to use scores on a screening a measure of overall psychopathy or antisocial behavior to select out a subsample relatively high in psychopathy that can then be used to differentiate psychopathy subtypes.

#### Validation Variables and Replication

Once clusters have been identified, it is then necessary to validate the clusters in terms of meaningful differences on variables not used to define the cluster structure. As mentioned, differences should be evident on theoretically relevant criterion variables, for example, measures that index putative etiological processes or variables of clinical importance, such as risk for violence or suicide, recidivism, or treatment response.

Finally, replicating the cluster structure identified in a dataset is fundamental to establishing that the clusters are naturally occurring subtypes that represent meaningful psychological differences. In the context of replication, examination of potential moderating variables such as age, gender, and race/ethnicity can provide further clues to the nature of subtype differences.

#### Empirical Investigations of Psychopathy Subtypes

A number of empirical studies have been conducted in recent years to identify and characterize psychopathy subtypes using a variety of analytic methods, clustering and validation variables, and types of samples. The major results of these studies are summarized in Table 13.1. A review of the existing empirical literature on psychopathy subtypes points to a number of compelling findings across investigations, as well as some points of ambiguity and inconsistency.

IADLE 13.1.	Ешринсан гэусг	Inparity Subtypi	eainnic fill			
Study	Sample	Quantitative approach	Cluster variables	Clusters	Validation and results	Computed effects
			a. Adı	ılt offenders high on psychopa	hy	
Blackburn, Logan, Donnelly,	79 male forensic patients with	Traditional cluster analysis (Ward's	APQ Impulsivity and Withdrawal second-order	Four groups: (1) primary psychopath, (2) secondary psychopath,	Secondary: higher incidence of Axis I anxiety disorders; higher Neuroticism and Introversion; greater trauma history.	1, 2, 3, 5
& Renwick (2008)	high PCL-R scores (>	hierarchical agglomerative	factors	(3) controlled, and (4) inhibited	Primary: highest PCL-R Factor 2, lowest PCL-R Factor 1, lowest IQ scores.	
	median <i>)</i>	metnoa followed by <i>k-</i> means analvsis)			Controlled: highest PCL-R Factor 1, lowest PCL-R Factor 2, fewest Axis I anxiety disorders, Anxiety and Neuroticism.	
					Inhibited: high Withdrawal and Anxiety; high levels of Axis I anxiety disorders and trauma history.	
					Groups and not durfer on crime variables.	
Blagov et al. (2011)	91 male incarcerated offenders with high PCL-R scores (≥ 30)	Prototype matching (Q-factor analysis)	SWAP-II psychopathology descriptors	Two groups: (1) primary (narcissistic) and (2) secondary (hostile and dysregulated) subtypes	<i>Primary:</i> endorsement of SWAP-II items indexing grandiosity, manipulativeness, remorselessness, deceitfulness, social, and sexually appealing. Positively correlated with PCL-R Factor 1, Extraversion, and Positive Emotionality.	Study did not report M/SD
					Secondary: endorsement of SWAP-II items indexing Impulsivity, Irresponsibility, Unstable Relationships and Lifestyle, Negative Affect, Emotional and Violent Outbursts, and Hostility. Modest positive correlations with PCL-R Factor 2, ASPD diagnosis, criminal versatility, and lower age at first charge.	
Cox et al. (2013)	Sample 1:679 male offenders meeting	Discriminant function analysis	PPI lower-order subscales	Four clusters: (1) primary psychopathy, (2) secondary psychopathy,	<i>Primary</i> : high Social Potency, Fearlessness, Machiavellian Egocentricity, low Carefree Nonplanfulness	1, 2
	criteria for ASPD			<ul><li>(3) nonpsychopathic, and</li><li>(4) fearful psychopathic offenders</li></ul>	<i>Secondary</i> : high Blame Externalization, lower on Machiavellian Egocentricity and Fearlessness	

TABLE 13.1. Empirical Psychopathy Subtyping Studies

	5* 5*	5* 5*	(continued)
<i>Fearful:</i> lowest on Fearlessness, otherwise similar to secondary <i>Nonpsychopathic:</i> lower scores on most PPI subscales Primary > secondary on Interpersonal Dominance, Recidivism, self-report measures of externalizing psychopathology Secondary > primary on Internalizing Symptoms, Impulsivity, Institutional Misconduct	<i>Emotionally stable</i> : low Stress Reaction, high Agency Aggressive: high Negative Emotionality, low Constraint, low Communion Aggressive > emotionally stable on PCL-R Factor 2, anxiety, fights in adulthood and childhood, earlier age of first charge, and more alcohol problems Emotionally stable > aggressive on Verbal IQ, Socialization Clusters did not differ on PCL-R total or Factor 1 scores	Secondary: high negative emotionality, low constraint; highest PCL-R Factor 2 scores; early onset of antisocial behavior, more violent behavior, and institutional misconduct; greater substance abuse and mental health problems; suicide attempts <i>Primary</i> : few distinguishing personality traits, but high rates of nonviolent crime, relatively few mental health problems Both groups higher PCL-R scores, adult and childhood syptoms of ASPD, criminal versatility, and earlier age of first charge, than nonpsychopathic comparison group	
	Two clusters: (1) emotionally stable and (2) aggressive	Two clusters: (1) primary psychopathy and (2) secondary psychopathy	
	MPQ-BF lower- order personality trait variables	MPQ-BF lower- order personality trait variables	
	Model-based cluster analysis	Model-based cluster analysis	
Sample 2:131 unselected male prisoners	96 male prisoners with high PCL-R scores (230)	70 female prisoners with high PCL-R scores (225)	
	Hicks, Markon, Patrick, Krueger, & Newman (2004)	Hicks, Vaidyanathan, & Patrick (2010)	

TABLE 13.1.	(continued)					
Study	Sample	Quantitative approach	Cluster variables	Clusters	Validation and results	Computed effects
Olver, Sewall, Sarty, Lewis, & Wong (2015)	314 male prisoners with high PCL-R scores (≥25 file review only)	<i>k</i> -means and model-based cluster analysis	PCL-R facets 1, 2, 3, and 4	Two clusters: (1) primary psychopathy and (2) secondary psychopathy	Secondary: higher PCL-R Antisocial facet scores, greater rate of recidivism for sexual offenses, higher static risk and general dynamic risk for violence, greater treatment change <i>Primary</i> : higher PCL-R Interpersonal and Affective facet scores, higher interpersonal dynamic risk for violence <i>Both</i> : higher on static and dynamic risk for violence, primary had less treatment change than nonpsychopathic comparison group	Excluded
Poythress et al. (2010)	691 male offenders who met DSM criteria for ASPD	Model-based cluster analysis	PCL-R facets 1, 2, and 3, PAI Anxiety, MPQ Harm Avoidance, three BAS subscales, CATS abuse scales	Five clusters: (1) primary psychopathy, (2) secondary psychopathy, (3) fearful psychopathic (4) nonpsychopathic ASPD, and (5) uninterpretable due to deliberate response distortion	Secondary: highest scores on abuse history, moderate scores on other clustering variables <i>Primary</i> : higher scores on PCL-R Interpersonal and Affective facets, low Harm Avoidance and Anxiety, high Reward Sensitivity; poor passive avoidance learning <i>Fearful</i> : high PCL-R Affective and Lifestyle facets, high Harm Avoidance Secondary > primary internalizing and externalizing psychopathology, impulsivity, treatment motivation, institutional infractions The primary and secondary groups did not differ in dominance, recidivism rates In a follow-up study (Magyar, Edens, Lilienfeld, Douglas, & Poythress, 2011), the secondary group reported more severe substance abuse problems than the secondary psychopathy group	1, 2, 5*
Skeem, Johansson, Andershed,	123 male prisoners with high PCL-R	Model-based cluster analysis	PCL-R facet scores, KSP anxiety	Two clusters: (1) primary psychopathy and (2) secondary psychopathy	The secondary group scored higher on Anxiety and the Interpersonal, Affective, and Lifestyle facets of the PCL-R than the primary group	1, 2, 3, 4, 5*

	No primary and secondary subtypes	3, 4, 5	ې ب
Secondary > primary in borderline personality features, symptoms of major mental disorder, irritability, withdrawal, poor assertiveness The two clusters did not differ on the Antisocial facet of the PCL-R	Psychopathic personality high scores on all 3 PCL:SV facets, higher prevalence of conduct disorder and substance use disorders. Three clusters did not differ on variables related to crimes or incarceration.	Prisoners within the aggressive/undercontrolled cluster scored significantly higher on almost all MMPI-2 basic scales, (in)direct aggression measures, and depressive coping scales compared with resilients. They also scored higher on drug abuse and committed more sexual offenses than resilient prisoners. Clusters did not differ on PCL-R total, factor, or facet scores.	<i>Primary</i> : Highest IM-P, PCL-R Interpersonal and Affective facet scores; mild drug and alcohol dependence; moderate anxiety <i>Secondary</i> : Highest anxiety, drug and alcohol dependence scores Primary > secondary violent charges, PCL-R total scores Primary and secondary groups did not differ on the behavioral lifestyle facet of the PCL-R; both groups greater criminal versatility and ASPD symptoms than other clusters
nders Unselected for Psychopat	Three clusters: (1) Unemotional/Impulsive– Irresponsible, (2) low traits, and (3) low psychopathy traits	Two clusters: (1) emotionally stable/ resilient and (2) aggressive/ undercontrolled	Four clusters: (1) low-psychopathology criminals, (2) criminals with negative affect, (3) primary psychopaths, and (4) secondary psychopaths
b. Adult Offe	PCL.SV Facets 1, 2, and 3	FFI Neuroticism, Extraversion, and Openness scores	PCL-R facets 1, 2, and 3, IM-P scores, STAI Trait Anxiety, drug and alcohol dependence
	Model-based cluster analysis	Model-based cluster analysis	k-means iterative cluster analysis based on multiple random starting points (Steinley, 2003)
scores (≥29)	148 unselected young male incarcerated offenders (M age = 19.07)	110 unselected Flemish adult male prisoners	258 unselected white male prisoners
Kerr, & Eno Louden (2007)	Andershed, Köhler, Eno Louden, & Hinrichs (2008)	Claes et al. (2014)	Swogger & Kosson (2007)

(continued)

313

scores (≥29)

Kerr, & Eno Louden (2007)

TABLE 13.1.	(continued)					
Study	Sample	Quantitative approach	Cluster variables	Clusters	Validation and results	Computed effects
Swogger, Walsh, & Kosson (2008)	262 unselected African American male prisoners	<i>k</i> -means iterative cluster analysis based on multiple random starting points (Steinley, 2003)	PCL-R facets 1, 2, and 3, IM-P scores, STAI Trait Anxiety, drug and alcohol dependence	Six clusters: (1) primary psychopaths, (2) secondary psychopaths, (3) low-psychopathology criminals, (4) anxious, antisocial criminals, (5) alcohol-dependent criminals, and (6) drug- dependent criminals	<i>Primary</i> : highest IM-P scores, high PCL-R Interpersonal and Affective facet scores, some alcohol and drug abuse, relatively low anxiety Secondary: high IM-P scores and all PCL-R facets, moderately high trait anxiety, and moderate drug and alcohol dependence Both groups had higher rates of violent and nonviolent charges, greater criminal versatility, and greater symptoms of ASPD than the other groups, but did not differ from each other	Ś
Vassileva, Kosson, Abramowitz, & Conrod (2005)	200 unselected male prisoners	Ward's hierarchical cluster analysis and <i>k</i> -means nonhierarchical method	PCL-R factors 1 and 2, IM-P scores, STAI Trait Anxiety, drug and alcohol dependence	Four clusters: (1) primary psychopaths, (2) secondary psychopaths, (3) nonpsychopathic criminals with alcohol and drug problems, and (4) criminals with features of psychopathy	<i>Primary</i> : highest scores on PCL-R Factor 1 and IM-P, average PCL-R Factor 2 scores; lower anxiety and less severe drug and alcohol problems than secondary Secondary: highest anxiety, drug and alcohol problems, PCL-R Factor 2 scores; average PCL-R Factor 1 and IM-P scores Primary > secondary on violent charges, number of incarcerations; both psychopathy groups greater criminal versatility than other groups	2, 5*
Coid, Freestone, & Ulrich (2012)	186 mixed gender adults in Great Britain scoring greater than zero on the PCL:SV	Hierarchical cluster analysis including Ward's method and <i>k</i> -means	PCL:SV facets	Five clusters: (1) criminal psychopaths, (2) nonpsychopathic habitual criminals, (3) successful psychopaths, and (4) social failures	The results of this study are difficult to intepret, as only one group (criminal psychopaths) showed appreciable levels of psychopathic traits ( $M = 12.64$ ; typical PCL:SV cutoff score for psychopathy = 18). This group displayed elevated personality disorder, substance use, and affective/anxiety disorder symptoms, as well as greater social and behavioral problems, including incarceration, relative to a nonpsychopathic control group.	No primary and secondary subtypes

(continue	
13.1.	
TABLE	

1, 2, 3, 4	2, 4*	1, 2, 3, 4	(continued)
<i>Primary psychopathy:</i> lower Anxiety/Depression and higher Boldness facet of psychopathy <i>Seconday psychopathy:</i> higher Anxiety/Depression and Disinhibition facets of psychopathy; higher internalizing problems. Both groups equally high on meanness facet of psychopathy; elevated externalizing symptoms and police records of criminal behavior compared to low- psychopathy control group. Primary > secondary rates of violent crime	<i>Primary psychopathic-like-traits group:</i> higher LPS primary scores, above average secondary scores, and average scores on BIS, BAS, and anxiety scores, and high LSP secondary psychopathic-like-traits group: high LSP secondary scores, average primary scores, and higher scores on BIS, BAS, and anxiety Two psychopathic groups had significantly higher scores on aggression than nonpsychopathic groups; instrumental aggression was preferentially associated with the primary group.	<i>Primary</i> : highest PPI Factor 1, NPI-Overt and lower scores on STAI and BPDQ-R; lower scores on BIS than nonpsychopathic groups <i>Secondary</i> : highest PPI Factor 2, STAI, BPDQ-R, and NPI-Covert Secondary > Primary on self-reported Negative Affect, Total Aggression, Hostility, and Anger; lower Positive Affect Both groups higher than nonpsychopathic groups on various facets of aggression	
Two clusters: (1) primary psychopathy and (2) secondary psychopathy	Four clusters: (1) subclinical primary psychopathy, (2) subclinical secondary psychopathy, (3) low anxiety, and (4) normal temperament	Six clusters: (1) primary psychopathy, (2) secondary psychopathy, (3) low psychopathology 1, (4) low psychopathology 2, (5) neurotic features 1, and (6) neurotic features 2	
TriPM subscales, YASR Anxiety/ Depression	LPS primary and secondary subscales, BIS/ BAS scale, STAI trait anxiety	PPI Factors 1 and 2, NPI Overt and Covert subscales, STAI, BPDQ-R	
Model-based cluster analysis	Model-based cluster analysis	Model-based cluster analysis	
193 community Finnish men scoring at or above the 95th percentile on the TriPM	96 unselected male undergraduates	418 unselected mixed-gender undergraduates	
Drislane, Patrick, & Arsal (2014)	Falkenbach, Poythress, & Creevy (2008)	Falkenbach, Stern, & Creevy (2014)	

	00000000					
Study	Sample	Quantitative approach	Cluster variables	Clusters	Validation and results	Computed effects
Lee & Salekin (2010)	Sample 1:138 undergraduate men scoring in top one-third of PPL-SF scores (2136) Sample 2: 312 undergraduate women scoring in top-third of PPL-SF scores (2126)	Model-based cluster analysis	PPI-SF subscales	Two clusters for both men and women: (1) primary subtype, and (2) secondary subtype	<i>Male Primary</i> : high Social Potency, Fearlessness, Impulsive Nonconformity, and Stress Immunity; less Neuroticism, greater Extraversion Male Secondary: high Machiavellian Egocentricity and Blame Externalization, and lower Stress Immunity; less guilt, more antisocial activity and trouble with the law; more likely to be detained in jail than low-psychopathy controls The results for female participants were more indicative of severity clusters than differing subtypes per se, as the primary group scondary group	1, 2, 3*
Brennan, Breitenbach, & Dieterich (2008)	1,572 juvenile offenders (1,453 juvenile offenders in replication sample)	Ward's method, standard <i>k</i> -means, bootstrapped <i>k</i> -means, and semisupervised pattern recognition technique	Youth COMPAS scales	Seven clusters (six clusters in replication sample): (1) Internalizing Youth A (withdrawn, abuse, and rejected), (2) Socially Deprived (subcultural or socialized delinquents), (3) Low Control A (versarile offenders), (4) Normal "Accidental/ Situational" Delinquents, (5) Internalizing Youth B (with positive parenting), (6) Low Control B (early onset, versatile offenders with multiple risk factors	Two clusters with salient psychopathic traits: Low Control A and B both marked by impulsivity, low remorse, low empathy, aggression/hostility, and manipulation, association with deviant peers. Relative to Low Control A, Low Control B was distinguished by a number of adverse environmental factors (poor parenting, low emotional support, neglect, physical abuse, drug use, promiscuity). Both Low Control groups had early age at first adjudication, higher number of adjudications.	No primary and secondary subtypes

	No primary and secondary subtypes		1, 2, 3, 4		(continued)
	Emotionally labile, close-minded and goal-oriented: low Emotional Stability, low Openness to Experience, high Conscientiousness; relatively lower scores on externalizing problems Undercontrolled: low Openness to Experience, Agreeableness, and Conscientiousenss; moderate scores on externalizing problems Emotionally labile-careless: low Emotional Stability and Conscientiousness; highest externalizing problems, impulsive-irresponsible features of psychopathy	Classes did not differ on internalizing symptomotology or the interpersonal or affective features of psychopathy	<i>Secondary:</i> highest scores on Conduct Problems; higher Anxiety than primary; lower Self-Esteem, Greater Narcissism and Aggression; greater susceptibility to peer pressure <i>Primary:</i> higher Self-Esteem	Primary and secondary groups equally high on ICU and considerably higher than nonpsychopathic groups; also markedly higher on Conduct Problems, Reactive Aggression, Proactive Aggression, Impulsivity, Narcissism, Disinhibition, and Boredom Susceptibility; lower on Conformity/Obedience	High-CU groups did not differ on Sensation Seeking
[this cluster did not replicate]), (7) Normative Delinquency (drugs, sex, and peers)	Three classes: (1) emotionally labile, close- minded and goal-oriented, (2) undercontrolled, and (3) emotionally labile- careless		Four groups: (1) low risk, (2) anxious, (3) secondary callous-unemotional, and (4) primary callous- unemotional		
	FFM personality traits (QFI)		ICU, Y1-4 Conduct Problems and Anxiety subscales		
	Latent class analysis		Latent profile analysis		
	342 unselected, mixed-gender Flemish detained adolescents		2,306 unselected mixed gender Greek–Cypriot adolescents		
	Decuyper et al. (2013)		Fanti, Demetriou, & Kimonis (2013)		

<b>TABLE 13.1</b> .	(continued)					
Study	Sample	Quantitative approach	Cluster variables	Clusters	Validation and results	Computed effects
Kahn et al. (2013)	272 mixed- gender, clinic- referred youth	Model-based cluster analysis	CU factor of the APSD, YSR Anxiety/ Depression, Trauma Exposure, and PTSD Symptoms scores from the CATS	Three clusters: (1) low-CU traits, anxious/ conduct problems, (2) secondary variant, and (3) primary variant	<i>Primary variant:</i> high CU traits, low anxiety and trauma; lower scores on behavioral inhibition system Functioning, Impulsivity; perceived as less credible reporters <i>Secondary variant:</i> high CU traits, anxiety, and trauma; greater abuse history, higher scores on self-report measures of Impulsivity, Externalizing Problems, Aggression, and behavioral activation system functioning	1, 2, 4
					on parent-report measures	
Kimonis, Skeem, Cauffinan, & Dmitrieva (2011)	116 high PCL:YV. scoring (≥27) male juvenile offenders	Model-based cluster analysis	PCL:YV facets and RCMAS anxiety subscales	Two clusters: (1) low- anxiety primary variant, and (2) high-anxiety secondary variant	Secondary > primary on PCL:SV Interpersonal facet, Anxiety; Abuse History, Hostility, Depression, Psychological Distress; institutional violence particularly reactive violence, and psychosocial immaturity <i>Primary</i> : lower Physiological, Worry, and Social Concerns facets of anxiety than both secondary and low-psychopathy control group Clusters did not differ on PCL:SV Affective, Lifestyle, or Behavioral facets or instrumental violent institutional incidents	1, 2, 4, 5

lcontinu
13.1.
TABLE

inty > primary on an xitery lacces, 1111 total and ive-Irresponsible factor scores; abuse history, nal and attention problems y less anxious than nonpsychopathic control adiose-Manipulative factor scores y not engaged by emotionally distressing pictures, s secondary more attentive to distressing pictures, low-up study (Kimonis, Tatar, & Cauffman, the secondary variant also displayed greater nee use frequency prior to incarceration, substance while incarcerated, and diagnoses of DSM	The use unsoluted relative to the primary group sty, Depression, Suicidal Ideation), Trauma, ADHD sis, and Antidepressant Use y similar levels of psychological distress to chopathic control juveniles. lary group more likely to have suffered head and greater drug use, self-reported delinquency, offending, and property offending than the veroup.
) primary Secon secondary Impul Prima γouth Two v Grz Prima where In a fc 2012), substa	primary, Secon ry Anxie Diagn Prima nonps Secon injury violen
Iwo clusters: (1) variant and (2) ; variant	Two classes: (1) and (2) seconda
YPI factors and RCMAS anxiety subscales	BSI subsales, MAYSI-2 Traumatic Experience and Suicidal Ideation subscales, ADHD diagnosis, antidepressant medication
Model-based cluster analysis	Finite mixture modeling
165 high YPI scoring (>121.5) male adolescent offenders	132 mixed- gender juvenile offenders scoring high on the APSD (≥24)
Kimonis, Frick, Cauffman, Goldweber, & Skeem (2012)	Vaughn, Edens, Howard, & Smith (2009)

Note. Asterisks indicate that the study included in effect sizes computed comparing psychopathy variants with control participants.

Two areas on which we focused were subtypes differences on psychopathy facets and personality traits. To address these topics empirically, we calculated weighted mean effect sizes (Cohen's d) for differences between primary and secondary variants, and, where possible, between psychopathy variants and a low psychopathy control group (Table 13.2). We first examined differences between the psychopathic subtypes and the control groups on measures of psychopathy to establish that the reported subtypes were in fact groups of highly psychopathic individuals. Next, we examined subtype differences on measures of personality traits, so that we could begin to draw firmer conclusions about the personality structures of the psychopathy subtypes. We organized the variety of personality measures across studies into the Big Three constructs of Negative Emotionality, Positive Emotionality/Extraversion, and Disinhibition (vs. Constraint). Because findings differed in important ways for facets of Negative Emotionality, we further differentiated this personality domain into Neuroticism (which included measures of Trait Anxiety, Emotional Distress, and Stress Reaction, as well as Neuroticism) and Anger/Aggression.

#### **Consistent Empirical Findings**

Across the 24 studies reviewed, 83% (20 studies) found evidence for clear primary and secondary psychopathy variants despite differences across studies in data-analytic techniques, clustering variables, sampling strategy (ranging from unselected community members to incarcerated offenders with high PCL-R scores), and participant characteristics (i.e., with regard to nationality, race, gender, and age). The studies that were exceptions still reported finding psychopathy-related subgroups, but their solutions did not yield two groups that closely matched conceptions of primary and secondary subtypes. Furthermore, these exceptions were notable in that each opted not to use a sample preselected to be high in psychopathic traits, though these studies varied in terms of whether the samples were community members (Coid, Freeston, & Ullrich, 2012), incarcerated male offenders (Andershed et al., 2008), or juvenile offenders (Brennan, Breitenbach, & Dieterich, 2008; Decuyper et al., 2013). Also of note, those studies that identified primary and secondary psychopathy variants using unselected samples (see Table 13.1, section B, and select studies in sections C and D) tended to yield less parsimonious solutions (M clusters = 4.25, Mdn = 4, range = 2-7) compared with studies in which the range of psychopathic traits was constrained to be high (M clusters = 2.58, Mdn = 2, range = 2-5).

To establish the basic validity of the reported subtypes, we compared the primary and secondary variants and a control group (when available) on measures of psychopathy. We present effect sizes for the PCL-R total and factors only, and another set of results that included all psychopathy measures (PCL-R measures inclusive) that index the interpersonal-affective and impulsive behavioral features of psychopathy, as well as measures of total psychopathy scores. The other psychopathy measures that contributed to these analyses include the PPI, TriPM, APSD, Levenson's Self-Report Psychopathy Scales (Levenson, Kiehl, & Fitzpatrick, 1995), and the Youth Psychopathy Inventory (Andershed, Köhler, Eno Louden, & Hinrichs, 2008).

Both the primary and secondary variants scored more than 2.5 SD's higher than low-psychopathy control groups on the PCL-R total score. Furthermore, the primary and secondary variants scored much higher (> 1 SD) than the control groups on both PCL-R Factor 1 and Factor 2 scores. The difference between the primary variant and controls on Factor 1 (d = 1.82, 95% CI: 1.66–1.98) was significantly greater than that for the secondary variant and controls (d = 1.14, 95% CI: 0.99–1.28), as the 95% CI's for these effect sizes did not overlap. Comparing the subtypes to each other, the primary variant had higher PCL-R total and Factor 1 scores, whereas the secondary variant had higher Factor 2 scores, though all these effect sizes were small (all d's < 0.30).

The subtype comparisons were very similar when including studies using psychopathy measures other than the PCL-R. The only notable difference was that all the effect sizes in these studies were slightly greater for group comparisons on the impulsive behavioral features of psychopathy. Also, we did not calculate effect sizes for comparisons between psychopathy subtypes and a control group on psychopathy total scores, as we identified only one study that included these comparisons for a non-PCL-R measure (Drislane, Patrick, Sourander, et al., 2014). Several studies also used callous-unemotional traits to characterize subtypes, and consistently reported much higher scores on this dimension of psychopathy for both the primary and secondary subtypes relative to nonpsychopathic comparison groups, but no significant differences between the two psychopathy variants (Drislane, Patrick, Sourander, et al., 2014; Fanti, Demetriou, & Kimonis, 2013; Kahn et al., 2013; Kimonis, Frick, Cauffman, Goldweber, & Skeem, 2012; Lee & Salekin, 2010). These results indicate that the primary and secondary variants reported in published studies to date both represent high-psychopathy subgroups that exhibit relatively small differences from each other in psychopathic traits.

Psychopathy subtypes in published studies have also shown more severe patterns of antisocial behavior relative to low-psychopathy control groups-including greater numbers of offenses with a high degree of criminal versatility (Drislane, Patrick, Sourander, et al., 2014; Hicks, Vaidyanthan, & Patrick, 2010; Swogger & Kosson, 2007; Swogger, Walsh, & Kosson, 2008; Vassileva, Kosson, Abramowitz, & Conrod, 2005), an earlier age of first offense (Hicks et al., 2010; Vassileva et al., 2005), and more symptoms of ASPD (Hicks et al., 2010; Swogger & Kosson, 2007; Swogger et al., 2008). Participants comprising psychopathy subgroups were also distinguished from the control groups by higher levels of aggression and callous personality traits (Drislane, Patrick, Sourander, et al., 2014; Falkenbach, Poythress, & Creevy, 2008; Falkenbach, Stern, & Creevy, 2014; Fanti et al., 2013; Hicks, Markon, Patrick, Krueger, & Newman, 2004).

More interestingly, primary and secondary psychopathy subtypes were found to differ from one another in terms of personality, psychopathology, putative etiological factors, and clinical outcomes in ways largely consistent with historical accounts of psychopathy subtypes. We focus first on differences in personality structure, vis-à-vis the weighted mean effect sizes reported in Table 13.2. Psychopathy subtypes were most consistently distinguished by negative emotional traits, with nearly every study conducted to date indicating higher levels of Negative Emotionality for the secondary relative to the primary variant. Consistent with this, the largest difference between the primary and secondary subtypes on personality traits was for Neuroticism (d = 1.28), followed by Anger/ Aggression (d = 0.75). Consistent with the notion of a severe subtype of ASPD or externalizing subtype, the secondary variant also scored higher on Disinhibition than the primary variant (d = 0.60). The primary subtype, however, was higher on Positive Emotionality/Extraversion (d = 0.70) than the secondary subtype, consistent with the conceptualization of good adjustment and greater social poise and engagement.

When possible, we also compared the psychopathy subtypes to a low-psychopathy control group to provide a broader context for characterizing their respective personality profiles. Relative to controls, the secondary subtype was very high on Anger/Aggression (d = 1.37), followed by Neuroticism (d = 0.72) and Disinhibition (d = 0.49). The secondary subtype was also slightly lower than controls on Positive Emotionality/Extraversion (d = -0.30). Notably, these findings are consistent with prior findings for the personality profile of the life-course-persistent offender (Moffitt et al., 1996, 2002; Moffitt & Caspi, 2001), and of ASPD (Krueger et al., 1996). In contrast, the primary subtype was slightly lower on Neuroticism (d =-0.33) and higher on Anger/Aggression (d = 0.54) and Disinhibition (d = 0.24) relative to the control groups. Somewhat surprisingly, the primary variant was not higher on Positive Emotionality/Extraversion (d = 0.09) relative to the control groups. These results indicate that the primary variant had relatively modest personality deviations despite their extreme antisocial deviance and psychopathic traits. This suggests that the primary subtype may not be especially deviant in terms of normal range personality traits.

Primary and secondary psychopathy variants also exhibited markedly different patterns of comorbid psychopathology. Despite high rates of criminal behavior, the primary variant was associated with little in the way of psychological maladjustment. In particular, the primary variant consistently exhibited few internalizing problems as evidenced by rates of fear and distress disorders commensurate with or lower than the control groups (Drislane, Patrick, Sourander, et al., 2014; Falkenbach et al., 2014; Hicks et al., 2004; Kahn et al., 2013; Kimonis, Skeem, Cauffman, & Dmitrieva, 2011; Lee & Salekin, 2010; Poythress et al., 2010; Swogger & Kosson, 2007; Swogger et al., 2008). By contrast, secondary psychopathy was associated with elevated levels of both internalizing and externalizing problems. In particular, the secondary subtype was more likely than the primary subtype to report having an anxiety disorder (Blackburn, Logan, Donnelly, & Renwick, 2008; Cox et al., 2013; Hicks et al., 2004; Poythress et al., 2010) and to have more severe alcohol and drug use problems (Claes et al., 2014; Hicks et al., 2004, 2010; Kimonis, Tatar, & Cauffman, 2012; Magyar, Edens, Lilienfeld, Douglas, & Poythress, 2011; Swogger & Kosson, 2007; Swogger et al., 2008; Vassileva et al., 2005; Vaughn, Edens, Howard, & Smith, 2009). Secondary psychopathy was

TABLE 13.2. Distinguishing F	eatures of Primary	and Seconda	ary Psychopa	thy Subtypes	Identified	l Empirically
Feature	Direction of effect	Average weighted effect size (Cohen's d)	95% confidence interval	Range of effect sizes	Number of studies	Total N's: Primary/secondary Secondary/control Primary/control
Psychopathic symptoms						
PCL-R Total Score	Primary > secondary	0.27	0.10 to 0.45	-0.45 to 0.97	9	249/252
	Secondary > control	2.87	2.62 to 3.11	1.44 to 4.38	4	178/446
	Primary > control	2.60	2.36 to 2.84	0.82 to 4.84	4	174/446
PCL-R Factor 1	Primary > secondary	0.26	0.13 to 0.39	-0.59 to 1.27	œ	425/481
	Secondary > control	1.14	0.99 to 1.28	0.24 to 2.83	5	344/646
	Primary > control	1.82	1.66 to 1.98	0.68 to 2.98	5	320/646
PCL-R Factor 2	Secondary > primary	0.23	0.11 to 0.36	-0.13 to 0.66	6	455/547
	Secondary > control	1.62	1.47 to 1.77	0.40 to 4.10	5	344/646
	Primary > control	1.43	1.28 to 1.58	0.26 to 3.42	5	320/646
Psychopathy Total Symptoms	Primary > secondary	0.30	0.17 to 0.43	-0.52 to 0.45	6	545/446
Interpersonal-Affective Symptoms	Primary > secondary	0.20	0.11 to 0.29	-0.59 to 1.27	15	1,107/866
	Secondary > control	1.27	1.13 to 1.41	0.24 to 2.83	8	649/927
	Primary > Control	1.66	1.50 to 1.82	0.68 to 2.98	8	489/927

Impulsive Behavioral Symptoms	Secondary > primary	0.58	0.50 to 0.67	-0.13 to 1.48	17	1,260/977
	Secondary > control	1.92	1.80 to 2.04	0.40 to 4.10	8	649/927
	Primary > control	1.76	1.63 to 1.89	0.26 to 3.42	8	489/927
<u>Personality Traits</u> <u>Negative Emotionality</u>						
Neuroticism	Secondary > primary	1.28	1.20 to 1.38	0.63 to 2.77	17	1,139/1,037
	Secondary > control	0.72	0.62 to 0.83	-0.13 to 3.35	8	536/1,212
	Primary < control	-0.33	-0.22 to -0.43	-0.80 to 0.05	8	527/1,212
Anger/Aggression	Secondary > primary Secondary > control Primary > control	0.75 1.37 0.54	0.65 to 0.86 1.19 to 1.54 0.40 to 0.68	0.36 to 2.45 0.67 to 2.06 -0.22 to 0.80	11 5	904/569 205/673 298/673
Positive Emotionality/Extraversion	Primary > secondary	0.70	0.60 to 0.82	-0.36 to 1.63	11	843/590
	Secondary < control	-0.30	-0.18 to -0.43	-1.39 to 0.49	6	340/1,013
	Primary = control	0.09	-0.03 to 0.20	-0.34 to 0.54	6	376/1,013
Disinhibition	Secondary > primary Secondary > control Primary > control	0.60 0.49 0.24	0.52 to 0.70 0.37 to 0.61 0.13 to 0.37	0.05 to 3.94 0.26 to 0.99 0.03 to 0.39	5 5 5	1,160/842 382/865 331/865

also associated with other mental health problems, including borderline personality disorder (Falkenbach et al., 2014), symptoms of major mental disorders (Skeem, Johansson, Andershed, Kerr, & Eno Louden, 2007), and maladaptive coping strategies (Claes et al., 2014; Hicks et al., 2010). Several studies also indicated that secondary psychopathy is associated with social skills deficits, including poor assertiveness, social anxiety and withdrawal, immaturity, and susceptibility to peer pressure (Blackburn et al., 2008; Fanti et al., 2013; Kimonis et al., 2011; Skeem et al., 2007).

Studies that have included variables indexing important environmental influences suggest potential etiological differences in the development of primary and secondary psychopathy. Specifically, secondary psychopathy shows positive associations with retrospective accounts of having experienced trauma or abuse, including childhood sexual abuse, physical abuse, and neglect (Blackburn et al., 2008; Kahn et al., 2013; Kimonis et al., 2011; Kimonis, Frick, et al., 2012; Poythress et al., 2010; Vaughn et al., 2009). Consistent with this, secondary psychopathy has been found to be associated with higher rates of posttraumatic stress disorder (Blackburn et al., 2008; Hicks et al., 2010; Kahn et al., 2013). However, longitudinal research is needed to clarify the causal nature of this relationship.

Differences between primary and secondary subtypes have also been observed for institutional behavior and important clinical outcomes. Multiple studies have indicated higher incidence of institutional infractions in secondary than in primary psychopathic incarcerated offenders, particularly for infractions involving impulsive or reactive aggression (Cox et al., 2013; Hicks et al., 2010; Kimonis et al., 2011; Poythress et al., 2010). Nevertheless, there is also evidence that the secondary subtype is associated with greater treatment motivation (Poythress et al., 2010) and treatment change (Olver, Sewall, Sarty, Lewis, & Wong, 2015) than the primary subtype, with higher likelihood of reporting receipt of mental health treatment or use of prescribed antidepressant medications in the past (Hicks et al., 2010; Vaughn et al., 2009). This is notable given that secondary psychopathy is associated with elevated suicidal ideation and suicide attempts (Hicks et al., 2010; Vaughn et al., 2009). These findings suggest potentially important differences in treatment targets and planning for primary versus secondary psychopathy variants.

Findings for the relationship between psychopathy subtypes and criminal behavior were mixed. Some studies have reported no significant differences between primary and secondary psychopaths for different types of crimes (Blackburn et al., 2008; Kimonis et al., 2011; Skeem et al., 2007; Swogger et al., 2008). By contrast, several investigators have found a stronger association for secondary psychopathy with criminal behavior (Blagov et al., 2011; Hicks et al., 2004, 2010; Lee & Salekin, 2010; Vaughn et al., 2009), including sexual offenses (Claes et al., 2014). Furthermore, Olver and colleagues (2015) found higher longterm recidivism rates for sexual offenses in particular, and Poythress and colleagues (2010) found a trend toward greater rates of recidivism for violent offenses more broadly in secondary psychopaths. In contrast, others have reported higher rates of criminal behavior for primary than for secondary psychopathic offenders (Swogger & Kosson, 2007; Vassileva et al., 2005), including violent crimes (Drislane, Patrick, Sourander, et al., 2014) and instrumental aggressive acts (Falkenbach et al., 2008), as well as higher recidivism rates for primary psychopathic offenders (Cox et al., 2013).

## Psychopathy as the Interaction among Personality Traits

In addition to person-centered analyses of the types we reviewed earlier, there is growing interest in a trait-based approach to subtypes that flows from the view of psychopathy as entailing a configuration of certain personality traits. One method to operationalize such a model is to test for statistical interactions among traits. Such an approach is relevant to subtypes because interactions are often the consequence of a subgroup-defined by low or high levels on two or more traits—whose scores on a criterion variable deviates from an additive model of the constituent traits (i.e., the whole is greater than the sum of the parts). Evidence of such nonlinear associations between a distinct personality profile and criterion variables that are of theoretical importance to psychopathy then suggests that persons with that particular personality structure represent a distinct subgroup. For example, persons scoring high on both boldness and disinhibition might exhibit levels of antisocial behavior exceeding what would be predicted based on additive effects of the two traits; that is, there would be a significant Boldness × Disinhibition interaction in the prediction model for antisocial behavior.

Hicks (2014) reported preliminary analyses consistent with the perspective that a subgroup of persons scoring high on both Boldness and Disinhibition might be conceptualized as a subtype of psychopathy due to a distinct pattern of nonlinear associations with theoretically important variables. For these analyses, Hicks used data from the Minnesota Twin Family Study (MTFS; Iacono, Carlson, Taylor, Elkins, & McGue, 1999), a large, community-representative longitudinal study of twins born in Minnesota. The youngest twins entered the study at age 11, while the oldest twins had been followed to age 29. This broad agerange was used to test whether interaction effects between psychopathic traits were consistent across different developmental periods using age-appropriate measures of boldness and disinhibition that had been validated in previous reports (Blonigen et al., 2005; Blonigen, Hicks, Krueger, Patrick, & Iacono, 2006; Hicks, Iacono, & McGue, 2014).

In twins age 11, Hicks (2014) detected a significant Boldness × Disinhibition interaction in the prediction of both externalizing and internalizing problems using a regression-based model. Relative to a low-risk group defined by low scores on Boldness and Disinhibition, persons scoring high on both Boldness and Disinhibition were especially elevated on externalizing problems, but not internalizing problems. Specifically, there was a large main effect of Disinhibition for externalizing problems, and the combination of high Disinhibition and high Boldness resulted in an especially high level of externalizing problems (i.e., a significant interaction effect). Participants scoring low on Disinhibition did not exhibit elevated externalizing problems, regardless of their level of Boldness. For internalizing problems, those with high Disinhibition and low Boldness scores showed elevated internalizing problems relative to the lowrisk comparison group (i.e., low Boldness and low Disinhibition scores). By contrast, participants scoring high in both Boldness and Disinhibition (i.e., the highest risk group for externalizing problems) did not differ on internalizing problems from the low-risk comparison group, and those scoring high in Boldness and low in Disinhibition exhibited fewer internalizing problems than comparison subjects.

Similar interaction effects between Boldness and Disinhibition were also observed at age 29. Participants scoring high on both Boldness and Disinhibition were again especially elevated on indicators of externalizing, including legal problems, adult antisocial behavior, and substance use problems. Those scoring high in Disinhibition and *low* in Boldness exhibited an especially high rate of psychiatric problems (i.e., history of treatment or hospitalization for a psychiatric problem, suicide attempt, and/or diagnosis of major depression), whereas participants scoring high on both Boldness and Disinhibition did not differ from those with low Disinhibition scores, regardless of their level of Boldness (i.e., the highest-risk group for externalizing did not differ from the low-risk groups in terms of psychiatric problems).

These findings are intriguing in that they suggest that individuals with high scores on Boldness and Disinhibition represent an extreme externalizing subgroup that lacks typically co-occurring internalizing problems. This lack of internalizing problems may in fact facilitate engagement in antisocial deviance. It is interesting to note that persons with high Boldness and low Disinhibition scores exhibited the lowest rates of psychopathology and highest levels of psychosocial adjustment. This indicates that boldness per se is not associated with psychopathology. Rather, Boldness appears to act as a moderator of disinhibitory tendencies, such that the combination of the two yields a distinct subsample that exhibits very high levels of antisocial deviance (i.e., an "externalizing supergroup"), while maintaining relatively stable emotional adjustment and competent interpersonal functioning. This description bears notable similarities to Cleckley's (1976) "mask of sanity" conception of psychopathy. While these findings are preliminary, the consistency across such broad developmental periods is especially noteworthy, and other researchers are beginning to report similar interaction effects between Boldness and Disinhibition for suicide risk (Venables et al., 2015), internalizing disorders (Nelson, Strickland, Krueger, Arbisi, & Patrick, 2016), and violence (Smith, Edens, & McDermott, 2013).

#### **Summary and Conclusions**

The notion of psychopathy subtypes has a long history, but only in recent years has a sufficiently large empirical literature accumulated to permit initial conclusions to be drawn regarding the nature of such subtypes. Based on our review of this existing literature, we conclude that there is now substantial evidence to support the notion that psychopathy subtypes exist and can be reliably identified in samples exhibiting high levels of psychopathic tendencies. Specifically, distinct psychopathy subgroups were detected across a variety of samples using several analytic methods and different clustering variables to define the subtypes. Furthermore, consistent evidence has been reported for two subgroups within high-psychopathy samples that roughly correspond to the historical distinction between primary and secondary psychopathy. Both subtypes appear extremely antisocial and psychopathic but exhibit distinctive personality structures.

In terms of distinguishing features, the primary subtype exhibits greater interpersonal–affective features of psychopathy, whereas the secondary subtype exhibits greater impulsive behavioral features. However, subtype differences on the interpersonal–affective and behavioral features of psychopathy were small. This result is not unexpected given that both documented subtypes have by definition scored high on overall psychopathy, which operates to restrict potential differences on facet traits of psychopathy. Instead, it is differences on normal personality traits not explicitly used to define psychopathy and antisocial behavior that have clearly differentiated the subtypes.

The largest subtype differences have been observed for facets of Negative Emotionality. Secondary psychopathy is consistently associated with large elevations on Negative Emotionality and Disinhibition, and lower Positive Emotionality/ Extraversion. Secondary psychopathy also exhibits strong and consistent associations with indicators of mental health problems, including internalizing problems, substance use problems, suicidal behaviors, and treatment involvement. Due to the personality structure of high Negative Emotionality and Disinhibition and high levels of comorbidity with other forms of psychopathology, our conclusion is that secondary psychopathy might be better conceptualized as a severe variant of ASPD, akin to the life-course-persistent offender.

The other subgroup that has typically been detected within high-psychopathy samples appears broadly consistent with conceptions of primary psychopathy and is characterized by low Negative Emotionality and high Positive Emotionality/Extraversion. Relative to nonpsychopathic control groups, however, personality deviations for the primary subtype appear relatively minor. In fact, the weighted mean effect size in our analysis for the difference between the primary subtype and control groups on Positive Emotionality/Extraversion was not statistically significant. Furthermore, the effect size for the difference between the primary subtype and control groups for Neuroticism-usually considered a defining feature of primary psychopathy-was small and less than the difference for Anger/Aggression (primary > control). We believe the elevation on measures of Anger/Aggression is likely a function of low Agreeableness, a broad trait that has been posited to comprise the common core across facets and variants of psychopathy (Lynam & Widiger, 2007). Additionally, the primary subtype exhibited comparable or even reduced levels of internalizing problems relative to controls, suggesting relatively good mental health.

It is worth repeating that despite the lack of large differences in normal-range personality traits, subgroups corresponding to the primary variant score extremely high on various measures of psychopathy (including the PCL-R) and exhibit exceedingly high levels of antisocial behavior. Thus, primary psychopathic individuals are not "normal" people. Rather, as a group, they appear unremarkable in terms of their profile of scores on self-report inventories of personality traits. This suggests that there is substantial variability in the personality structures of primary psychopaths, though they tend to be slightly less neurotic and more interpersonally aggressive on average than nonpsychopaths.

Interpretations regarding the defining features of a psychopathological condition are typically easier to make when individuals with that condition consistently exhibit differences from those without the disorder on key criterion variables. Primary psychopathy, however, may be a case in which finding a lack of differences on certain variables of interest can be interpreted as consistent with theory. Specifically, we believe the current findings are broadly consistent with Cleckley's (1976) notion of a "mask of sanity," that is, extreme antisocial deviance coexisting alongside a relatively benign personality structure, which in some cases presents as well adjusted. Again, this is not to say that primary psychopathic individuals are "normal"-only that they have a superficial presentation of normality that contrasts starkly with the blatant personality pathology displayed by secondary psychopathic individuals. An important aim for future research, however, will be to identify variables beyond psychopathy and antisocial behavior (e.g., neurophysiological or task-behavioral measures) that more clearly distinguish primary psychopathy from nonpsychopathy and help to clarify the source of its pathological behavioral manifestations.

#### **Future Directions**

Research on psychopathy subtypes has reached an important milestone in that it now seems reasonable to conclude that distinctive variants in fact exist. Many other tasks, however, remain to be completed. An initial goal would be to expand upon the results of our estimates of meta-analytic effects for psychopathy features and broad personality constructs to obtain quantitative estimates of differences between psychopathy subtypes on other important clinical (e.g., treatment response and outcome, physical health and longevity) and laboratory (e.g., cognitive and affective task performance, neurophysiological response) criterion measures. Comparisons across psychopathic subtypes, and between psychopathy subtypes and low-psychopathy control participants, will be especially useful for refining characterization of the distinguishing features of psychopathy subtypes and framing interpretation of these subtype-defining features in a broader theoretic context.

Another area in need of further research is the potential role of moderating influences such as gender and race/ethnicity on observed subtypes. For example, in two studies using virtually identical methods, Hicks and colleagues (2004, 2010) identified primary and secondary subtypes in separate analyses across male and female prisoners. The secondary subtype was very similar in terms of personality structure across men and women. The primary subtype, however, was less consistent across gender: Primary psychopathic males appeared well adjusted/low-neurotic and scored high in Positive Emotionality/Extraversion, whereas primary psychopathic females evidenced few defining personality features relative to controls, though they had showed markedly elevated PCL-R scores (M = 28.6, SD = 3.4), along with high levels of antisocial behavior. It is unclear whether this gender divergence reflects the differential expression of a common etiological mechanism in women as compared to men, or gender-related selection factors that resulted in male and female prisoners comprising somewhat different populations in terms of personality structure. Regardless of interpretation, this work highlights the potential importance of characteristics such as gender, race/ethnicity, and age as "third variables" (i.e., moderators) for helping to advance our understanding of psychopathy and its variants.

Another important finding in need of followup is that of previously noted interactions between Boldness and Disinhibition in predicting criterion variables of theoretical importance to psychopathy. If these findings prove to be reliable, it would be an example of the often-discussed (Grove & Tellegen, 1991) but rarely demonstrated instance of a configuration of personality traits having emergent properties that result in what can be described as a personality disorder. Our own speculation is that these interactions are facilitated by the orthogonality (i.e., lack of correlation) between Boldness and Disinhibition. Such a circumstance is relatively uncommon for two personality constructs both connected to the same content domain. Analytically, this circumstance approximates the effect of random assignment in an experimental design, the preferred situation for detecting interactions using a general linear model framework. If this is in fact the case, we predict that it will be difficult to detect interactions between Meanness and Disinhibition given their relatively high correlation. Rather, it seems more likely that secondary psychopathy or the severe ASPD subtype can be better conceptualized as reflecting the additive and potentially incremental influences of Meanness and Disinhibition, whereas the primary or Cleckley subtype can be conceptualized as arising from the interactive synergy between Boldness and Disinhibition.

Finally, the study of psychopathy subtypes has vet to contribute much to our understanding of etiological influences contributing to psychopathy and antisocial behavior. A straightforward approach would be to conduct cluster analyses using psychometric measures (e.g., personality traits, psychopathy features) in a sample with high levels of antisocial behavior to identify psychopathic subtypes, then compare the groups on measures that index processes posited to be of etiological significance to psychopathy. This might include indices of peripheral physiological reactivity (e.g., startle magnitude while viewing affective pictures; Vaidyanathan, Hall, & Patrick, 2011) and neural activation (Foell et al., 2016; Nelson, Patrick, & Bernat, 2011) that have been differentially linked to the interpersonal-affective or impulsive behavioral features of psychopathy. Alternatively, variables of these types could be included in the cluster analysis itself to help define the subgroups, though if effect sizes for group differences were small, these measures would have only a small influence on the cluster solution. In any event, studies that go beyond report-based variables and naturalistic behavioral outcomes to include measures of underlying processes have the potential to substantially increase the validity of psychopathy subtypes and the utility of this conceptualization in helping to clarify the linkages between personality dispositions and antisocial behavior.

#### ACKNOWLEDGMENT

Preparation of this chapter was supported by U.S. Public Health Service Grant Nos. R01 DA034606 and K01 DA025868 to Brian M. Hicks from the National Institute on Drug Abuse.

#### NOTE

 The term "subtypes" is often associated with a categorical distinction; therefore, some prefer the term "variants" as it has a broader connotation that accommodates dimensional perspectives on subgroups. We see this as a subtle distinction and that the issue of identifying and validating subgroups has both categorical and dimensional aspects. Therefore, we use the terms "subtypes" and "variants" relatively interchangeably.

#### REFERENCES

- Andershed, H., Köhler, D., Eno Louden, J., & Hinrichs, G. (2008). Does the three-factor model of psychopathy identify a problematic subgroup of young offenders? International Journal of Law and Psychiatry, 31, 189–198.
- Benning, S. D., Patrick, C. J., Blonigen, D. M., Hicks, B. M., & Iacono, W. G. (2005). Estimating facets of psychopathy from normal personality traits: A step toward community–epidemiological investigations. Assessment, 12, 3–18.
- Benning, S. D., Patrick, C. J., Hicks, B. M., Blonigen, D. M., & Krueger, R. F. (2003). Factor structure of the Psychopathic Personality Inventory: Validity and implications for clinical assessment. *Psychological As*sessment, 15, 340–350.
- Blackburn, R. (1975). An empirical classification of psychopathic personality. British Journal of Psychiatry, 127, 456–460.
- Blackburn, R. (1987). Two scales for the assessment of personality disorder in antisocial populations. *Per*sonality and Individual Differences, 8, 81–93.

- Blackburn, R. (1998). Psychopathy and personality disorder: Implications of interpersonal theory. In D. Cooke, A. Forth, & R. Hare (Eds.), Psychopathy: Theory, research, and implications for society (pp. 269–301). Dordrecht, The Netherlands: Kluwer Academic.
- Blackburn, R. (2006). Other theoretical models of psychopathy. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 35–57). New York: Guilford Press.
- Blackburn, R., Logan, C., Donnelly, J. P., & Renwick, S. J. D. (2008). Identifying psychopathic subtypes: Combining an empirical personality classification of offenders with the Psychopathy Checklist—Revised. *Journal of Personality Disorders*, 22, 604–622.
- Blagov, P. S., Patrick, C. J., Lilienfeld, S. O., Powers, A. D., Phifer, J. E., Venables, N., et al. (2011). Personality constellations in incarcerated psychopathic men. *Personality Disorders: Theory, Research, and Treatment*, 2, 293–315.
- Blonigen, D. M., Hicks, B. M., Krueger, R. F., Patrick, C. J., & Iacono, W. G. (2005). Psychopathic personality traits: Heritability and genetic overlap with internalizing and externalizing psychopathology. *Psychological Medicine*, 35, 637–648.
- Blonigen, D. M., Hicks, B. M., Krueger, R. F., Patrick, C. J., & Iacono, W. G. (2006). Continuity and change in psychopathic personality traits as measured via normal range personality: A longitudinal-biometric study. Journal of Abnormal Psychology, 115, 85–95.
- Blonigen, D. M., Patrick, C. J., Douglas, K. S., Poythress, N. G., Skeem, J. L., Lilienfeld, S. O., et al. (2010). Multimethod assessment of psychopathy in relation to factors of internalizing and externalizing from the Personality Assessment Inventory: The impact of method variance and suppressor effects. *Psychological Assessment*, 22, 96–107.
- Brennan, T., Breitenbach, M., & Dieterich, W. (2008). Towards an explanatory taxonomy of adolescent delinquents: Identifying several social-psychological profiles. *Journal of Quantitative Criminology*, 24, 179–203.
- Calinski, R. B., & Harabasz, J. (1974). A dendrite method for cluster analysis. Communications in Statistics, 3, 1–27.
- Caspi, A., Roberts, B. W., & Shiner, R. L. (2005). Personality development: Stability and change. Annual Review of Psychology, 56, 453–484.
- Claes, L., Tavernier, G., Roose, A., Bijttebier, P., Smith, S. F., & Lilienfeld, S. O. (2014). Identifying personality subtypes based on the five-factor model dimensions in male prisoners: Implications for psychopathy and criminal offending. *International Journal of Offender Therapy and Comparative Criminology*, 58, 41–58.
- Cleckley, H. (1976). The mask of sanity (5th ed.). St. Louis, MO: Mosby.
- Coid, J., Freeston, M., & Ullrich, S. (2012). Subtypes of psychopathy in the British household population: Findings from the national household survey of psy-

chiatric morbidity. Social Psychiatry and Psychiatric Epidemiology, 47, 879–891.

- Cormack, R. M. (1971). A review of classification. Journal of the Royal Statistical Society, Series A, 134, 321–367.
- Cox, J., Edens, J. F., Magyar, M. S., Lilienfeld, S. O., Douglas, K. S., & Poythress, N. G. (2013). Using the Psychopathic Personality Inventory to identify subtypes of antisocial personality disorder. *Journal of Criminal Justice*, 41, 125–134.
- Decuyper, M., Colins, O. F., De Clercq, B., Vermeiren, R., Broekaert, E., Bijttebier, P., et al. (2013). Latent personality profiles and the relations with psychopathology and psychopathic traits in detained adolescents. Child Psychiatry and Human Development, 44, 217–232.
- Drislane, L. E., Patrick, C. J., & Arsal, G. (2014). Clarifying the content coverage of differing psychopathy inventories through reference to the Triarchic Psychopathy Measure. *Psychological Assessment*, 26, 350–362.
- Drislane, L. E., Patrick, C. J., Sourander, A., Sillanmaki, L., Aggen, S. H., Elonheimo, H., et al. (2014). Distinct variants of extreme psychopathic individuals in social at large: Evidence from a population-based sample. Personality Disorders: Theory, Research, and Treatment, 5, 154–163.
- Essau, C. A., Sasagawa, S., & Frick, P. J. (2006). Callous-unemotional traits in a community sample of adolescents. Assessment, 13, 454–469.
- Falkenbach, D., Poythress, N., & Creevy, C. (2008). The exploration of subclinical psychopathic subtypes and the relationship with types of aggression. *Personality and Individual Differences*, 44, 821–832.
- Falkenbach, D. M., Stern, S. B., & Creevy, C. (2014). Psychopathy variants: Empirical evidence supporting a subtyping model in a community sample. *Personality Disorders: Theory, Research, and Treatment, 5*, 10–19.
- Fanti, K. A., Demetriou, C. A., & Kimonis, E. R. (2013). Variants of callous–unemotional conduct problems in a community sample of adolescents. *Journal of Youth and Adolescence*, 42, 964–979.
- Farrington, D., Ohlin, L., & Wilson, J. Q. (1986). Understanding and controlling crime. New York: Springer-Verlag.
- Foell, J., Brislin, S. J., Strickland, C. M., Seo, D., Sabatinelli, D., & Patrick, C. J. (2016). Externalizing proneness and brain response during pre-cuing and viewing of emotional pictures. Social Cognitive and Affective Neuroscience, 11, 1102–1110.
- Fowles, D. C. (1980). The three arousal model: Implications of Gray's two-factor learning theory for heart rate, electrodermal activity, and psychopathy. *Psychophysiology*, 17, 87–104.
- Fowles, D. C. (1993). Electrodermal activity and antisocial behavior: Empirical findings and theoretical issues. In J. C. Roy, W. Boucsein, D. Fowles, & J. Gruzelier (Eds.), Experimental personality and psychopathology research (pp. 263–284). New York: Springer.

- Fraley, C., & Raftery, A. E. (2002). Model-based clustering, discriminant analysis, and density estimation. *Journal of the American Statistical Association*, 97, 611–631.
- Frick, P. J., & Hare, R. D. (2001). Antisocial Process Screening Device. Toronto: Multi-Health Systems.
- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014). Can callous–unemotional traits enhance the understanding, diagnosis, and treatment of serious conduct problems in children and adolescents?: A comprehensive review. *Psychological Bulletin*, 140, 1–57.
- Gray, J. A. (1987). Perspectives on anxiety and impulsivity: A commentary. Journal of Research in Personality, 21, 493–509.
- Grove, W. M., & Tellegen, A. (1991). Problems in the classification of personality disorders. *Journal of Per*sonality Disorders, 5, 31–41.
- Hall, J. R., Drislane, L. E., Patrick, C. J., Morano, M., Lilienfeld, S. O., & Poythress, N. G. (2014). Development and validation of triarchic construct scales from the Psychopathic Personality Inventory. *Psychological Assessment*, 26, 447–461.
- Hare, R. D. (1980). A research scale for the assessment of psychopathy in criminal populations. *Personality* and Individual Differences, 1, 111–119.
- Hare, R. D. (1996). Psychopathy: A clinical construct whose time has come. Criminal Justice and Behavior, 23, 25–54.
- Hare, R. D. (1998). Psychopaths and their nature: Implications for the mental health and criminal justice systems. In T. Millon, E. Simonsen, M. Birket-Smith, & R. D. Davis (Eds.), Psychopathy: Antisocial, criminal, and violent behavior (pp. 188–212). New York: Guilford Press.
- Hare, R. D. (2003). The Hare Psychopathy Checklist— Revised (2nd ed.). Toronto: Multi-Health Systems.
- Hare, R. D., Harpur, T. J., Hakstian, A. R., Forth, A. E., Hart, S. D., & Newman, J. P. (1990). The Revised Psychopathy Checklist: Reliability and factor structure. Psychological Assessment, 2, 338–341.
- Hare, R. D., & Neumann, C. S. (2006). The PCL-R assessment of psychopathy: Development, structural properties, and new directions. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 58–88). New York: Guilford Press.
- Harpur, T. J., Hakstian, A. R., & Hare, R. D. (1988). Factor structure of the Psychopathy Checklist. Journal of Consulting and Clinical Psychology, 56, 741–747.
- Hicks, B. M. (2014, September). Conceptualizing psychopathy as an emergent trait: Interactions between boldness and disinhibition across development. Early Career Award address at the 28th annual meeting of the Society for Research in Psychopathology, Evanston, IL.
- Hicks, B. M., Iacono, W. G., & McGue, M. (2014). Identifying childhood characteristics that underlie premorbid risk for substance use disorders: Socialization and boldness. *Development and Psychopathology*, 26, 141–157.

- Hicks, B. M., Markon, K. E., Patrick, C. J., Krueger, R. F., & Newman, J. P. (2004). Identifying psychopathy subtypes on the basis of personality structure. *Psychological Assessment*, 16, 276–288.
- Hicks, B. M., & Patrick, C. J. (2006). Psychopathy and negative emotionality: Analyses of suppressor effects reveal distinct relations with emotional distress, fearfulness, and anger–hostility. *Journal of Abnormal Psychology*, 115, 276–287.
- Hicks, B. M., Vaidyanathan, U., & Patrick, C. J., (2010). Validating female psychopathy subtypes: Differences in personality, antisocial and violent behavior, substance abuse, trauma, and mental health. *Personality Disorders: Theory, Research, and Treatment*, 1, 38–57.
- Iacono, W. G., Carlson, S. R., Taylor, J., Elkins, I. J., & McGue, M. (1999). Behavioral disinhibition and the development of substance-use disorders: Findings from the Minnesota Twin Family Study. *Development* and Psychopathology, 11, 869–900.
- Kahn, R. E., Frick, P. J., Youngstrom, E. A., Kogos Youngstrom, J., Feeny, N. C., & Findling, R. L. (2013). Distinguishing primary and secondary variants of callous-unemotional traits among adolescents in a clinic-referred sample. *Psychological Assessment*, 25, 966–978.
- Karpman, B. (1941). On the need of separating psychopathy into two distinct clinical types: The symptomatic and the idiopathic. *Journal of Criminal Psychopathology*, 3, 112–137.
- Karpman, B. (1948). Conscience in the psychopath: Another version. American Journal of Orthopsychiatry, 18, 455–491.
- Karpman, B. (1955). Criminal psychodynamics: A platform. Archives of Criminal Psychodynamics, 1, 3–100.
- Kimonis, E. R., Frick, P. J., Cauffman, E., Goldweber, A., & Skeem, J. (2012). Primary and secondary variants of juvenile psychopathy differ in emotional processing. Development and Psychopathology, 24, 1091–1103.
- Kimonis, E. R., Skeem, J. L., Cauffman, E., & Dmitrieva, J. (2011). Are secondary variant of juvenile psychopathy more reactively violent and less psychosocially mature than primary variants? *Law and Human Behavior*, 35, 381–391.
- Kimonis, E. R., Tatar, J. R., & Cauffman, E. (2012). Substance-related disorders among juvenile offenders: What role do psychopathic traits play? *Psychology* of Addictive Behaviors, 26, 212–225.
- Krueger, R. F., Caspi, A., Moffitt, T. E., Silva, P. A., & McGee, R. (1996). Personality traits are differentially linked to mental disorders: A multitrait–multidiagnosis study of an adolescent birth cohort. *Journal of Abnormal Psychology*, 105, 299–312.
- Krueger, R. F., Hicks, B. M., Patrick, C. J., Carlson, S., Iacono, W. G., & McGue, M. (2002). Etiologic connections among substance dependence, antisocial behavior, and personality: Modeling the externalizing spectrum. *Journal of Abnormal Psychology*, 111, 411–424.

- Krueger, R. F., & Markon, K. E. (2014). The role of the DSM-5 personality trait model in moving toward a quantitative and empirically based approach to classifying personality and psychopathology. Annual Review of Clinical Psychology, 10, 477–501.
- Krueger, R. F., Markon, K. E., Patrick, C. J., Benning, S. D., & Kramer, M. (2007). Linking antisocial behavior, substance use, and personality: An integrative quantitative model of the adult externalizing spectrum. Journal of Abnormal Psychology, 116, 645–666.
- Lee, Z., & Salekin, R. T. (2010). Psychopathy in a nonistitutional sample: Differences in primary and secondary subtypes. Personality Disorders: Theory, Research, and Treatment, 1, 153–169.
- Levenson, M., Kiehl, K., & Fitzpatrick, C. (1995). Assessing psychopathic attributes in noninstitutionalized population. *Journal of Personality and Social Psychology*, 68, 151–158.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment*, 66, 488–524.
- Lilienfeld, S. O., & Widows, M. R. (2005). Psychopathic Personality Inventory—Revised (PPI-R) professional manual. Odessa, FL: Psychological Assessment Resources.
- Lubke, G. H., & Miller, P. J. (2015). Does nature have joints worth carving?: A discussion of taxometrics, model-based clustering and latent variable mixture modeling. *Psychological Medicine*, 45, 705–715.
- Lykken, D. T. (1957). A study of anxiety in the sociopathic personality. *Journal of Abnormal and Social Psychology*, 55, 6–10.
- Lykken, D. (1995). The antisocial personalities. Hillsdale, NJ: Erlbaum.
- Lynam, D. R., Gaughan, E. T., Miller, J. D., Miller, D. J., Mullins-Sweatt, S., & Widiger T. A. (2013). Assessing the basic traits associated with psychopathy: Development and validation of the Elemental Psychopathy Assessment. *Psychological Assessment, 23*, 108–124.
- Lynam, D. R., & Widiger, T. A. (2007). Using a general model of personality to identify the basic elements of psychopathy. *Journal of Personality Disorders*, 21, 160–178.
- Magyar, M. S., Edens, J. F., Lilienfeld, S. O., Douglas, K. S., & Poythress, N. G. (2011). Examining the relationship among substance abuse, negative emotionality and impulsivity across subtypes of antisocial and psychopathic substance abusers. *Journal of Criminal Justice*, 39, 232–237.
- McAdams, D. P., & Olson, B. D. (2010). Personality development: Continuity and change over the life course. Annual Review of Psychology, 61, 517–542.
- McCord, W., & McCord, J. (1964). The psychopath: An essay on the criminal mind. Princeton, NJ: Van Nostrand.

- Mealey, L. (1995). The sociobiology of sociopathy: An integrated evolutionary model. Behavioral and Brain Sciences, 19, 523–540.
- Miller, J. D., & Lynam, D. R. (2012). An examination of the Psychopathic Personality Inventory's nomological network: A meta-analytic review. Personality Disorders: Theory, Research, and Treatment, 3, 305–326.
- Moffitt, T. E. (1993). Adolescence-limited and lifecourse persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, 100, 674–701.
- Moffitt, T. E., & Caspi, A. (2001). Childhood predictors differentiate life-course persistent and adolescencelimited antisocial pathways among males and females. Development and Psychopathology, 13, 355–375.
- Moffitt, T. E., Caspi, A., Dickson, N., Silva, P., & Stanton, W. (1996). Childhood-onset versus adolescentonset antisocial conduct problems in males: Natural history from ages 3 to 18 years. *Development and Psychopathology*, 8, 399–424.
- Moffitt, T. E., Caspi, A., Harrington, H., & Milne, B. J. (2002). Males on the life-course-persistent and adolescence-limited antisocial pathways: Follow-up at age 26 years. *Development and Psychopathology*, 14, 179–207.
- Nelson, L. D., Patrick, C. J., & Bernat, E. M. (2011). Operationalizing proneness to externalizing psychopathology as a multivariate psychophysiological phenotype. *Psychophysiology*, 48, 64–73.
- Nelson, L. D., Strickland, C., Krueger, R. F., Arbisi, P. A., & Patrick, C. J. (2016). Neurobehavioral traits as transdiagnostic predictors of clinical problems. Assessment, 23, 75–85.
- Olver, M. E., Sewall, L. A., Sarty, G. E., Lewis, K., & Wong, S. C. P. (2015). A cluster analytic examination and external validation of psychopathic offender subtypes in a multisite sample of Canadian federal offenders. *Journal of Abnormal Psychology*, 124, 355– 371.
- Patrick, C. J. (1994). Emotion and psychopathy. Psychophysiology, 31, 319–330.
- Patrick, C. J. (2006). Back to the future: Cleckley as a guide to the next generation of psychopathy research. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 605–617). New York: Guilford Press.
- Patrick, C. J., Edens, J. F., Poythress, N. G., Lilienfeld, S. O., & Benning, S. D. (2006). Construct validity of the psychopathic personality inventory two-factor model with offenders. *Psychological Assessment*, 18, 204–208.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. Development and Psychopathology, 21, 913–938.
- Patrick, C. J., Hicks, B. M., Krueger, R. F., & Lang, A. R. (2005). Relations between psychopathy facets and externalizing in a criminal offender sample. *Journal* of Personality Disorders, 19, 339–356.
- Patrick, C. J., Hicks, B. M., Nichol, P. E., & Krueger, R.

F. (2007). A bifactor approach to modeling the structure of the Psychopathy Checklist—Revised. *Journal* of Personality Disorders, 21, 118–141.

- Paulhus, D. L., Robins, R. W., Trzesniewski, K. H., & Tracy, J. L. (2004). Two replicable suppressor situations in personality research. *Multivariate Behavioral Research*, 39, 303–328.
- Porter, S. (1996). Without conscience or without active conscience?: The etiology of psychopathy revisited. Aggression and Violent Behavior, 1, 1–11.
- Poythress, N. G., Edens, J. F., Skeem, J. L., Lilienfeld, S. O., Douglas, K. S., Frick, P. J., et al. (2010). Identifying subtypes among offenders with antisocial personality disorder: A cluster-analytic study. *Journal of Abnormal Psychology*, 119(2), 389–400.
- Raftery, A. E. (1995). Bayesian model selection in social research. Sociological Methodology, 25, 111–163.
- Robins, L. N. (1966). Deviant children grown up. Baltimore: Williams & Wilkins.
- Robins, L. N. (1978). Sturdy predictors of adult antisocial behavior: Replications from longitudinal studies. *Psychological Medicine*, 8, 611–622.
- Sellbom, M., & Phillips, T. R. (2013). An examination of the triarchic conceptualization of psychopathy in incarcerated and non-incarcerated samples. *Journal* of Abnormal Psychology, 122, 208–214.
- Skeem, J., Johansson, P., Andershed, H., Kerr, M., & Eno Louden, J. (2007). Two subtypes of psychopathic violent offenders that parallel primary and secondary variants. *Journal of Abnormal Psychology*, 116, 395–409.
- Skeem, J. L., Polaschek, D. L. L., Patrick, C. J., & Lilienfeld, S. O. (2011). Psychopathic personality: Bridging the gap between scientific evidence and public policy. Psychological Science in the Public Interest, 12, 95–162.
- Skodol, A. E., Gunderson, J. G., Pfohl, B., Widiger, T. A., Livesley, W. J., & Siever, L. J. (2002). The borderline diagnosis: I. Psychopathology, comorbidity, and personality structure. *Biological Psychiatry*, 51, 936–950.
- Skodol, A. E., Siever, L. J., Livesley, W. J., Gunderson, J. G., Pfohl, B., & Widiger, T. A. (2002). The borderline diagnosis: II. Biology, genetics, and clinical course. *Biological Psychiatry*, 51, 951–963.
- Smith, S. T., Edens, J. F., & McDermott, B. E. (2013). Fearless dominance and self-centered impulsivity interact to predict predatory aggression among forensic psychiatric inpatients. *International Journal of Foren*sic Mental Health, 12, 33–41.
- Smith, S. S., & Newman, J. P. (1990). Alcohol and drug abuse-dependence disorders in psychopathic and nonpsychopathic criminal offenders. *Journal of Abnormal Psychology*, 99, 430–439.
- Steinley, D. (2003). Local optima in K-means clustering: What you don't know may hurt you. Psychological Methods, 8, 294–304.
- Steinley, D. (2006). K-means clustering: A half-century

synthesis. British Journal of Mathematical and Statistical Psychology, 59, 1–34.

- Steinley, D., & Brusco, M. J. (2008). A new variable weighting and selection procedure for K-means cluster analysis. *Multivariate Behavioral Research*, 43, 77–108.
- Steinley, D., & Brusco, M. J. (2011a). Choosing the number of clusters in K-means clustering. *Psychologi*cal Methods, 16, 285–297.
- Steinley, D., & Brusco, M. J. (2011b). Evaluating mixture modeling for clustering: Recommendations and cautions. *Psychological Methods*, 16, 63–79.
- Swogger, M. T., & Kosson, D. S. (2007). Identifying subtypes of criminal psychopaths: A replication and extension. Criminal Justice and Behavior, 34, 953–970.
- Swogger, M. T., Walsh, Z., & Kosson, D. S. (2008). Psychopathy subtypes among African American county jail inmates. Criminal Justice and Behavior, 35, 1484– 1499.
- Tellegen, A. (1991). Personality traits: Issues of definition, evidence, and assessment. In D. Cicchetti & W. Grove (Eds.), *Thinking clearly about psychology: Es*says in honor of Paul Everett Meehl (pp. 10–35). Minneapolis: University of Minnesota Press.
- Vaidyanathan, U., Hall, J. R., & Patrick, C. J. (2011). Clarifying the role of defensive reactivity deficits in psychopathy and antisocial personality using startle reflex methodology. *Journal of Abnormal Psychology*, 120, 253–258.
- Vassileva, J., Kosson, D. S., Abramowitz, C., & Conrod, P. (2005). Psychopathy versus psychopathies in classifying criminal offenders. *Legal and Criminological Psychology*, 10, 27–43.

- Vaughn, M. G., Edens, J. F., Howard, M. O., & Smith, S. T. (2009). An investigation of primary and secondary psychopathy in a statewide sample of incarcerated youth. Youth Violence and Juvenile Justice, 7, 172–188.
- Venables, N. C., Hall, J. R., & Patrick, C. J. (2014). Differentiating psychopathy from antisocial personality disorder: A triarchic model perspective. *Psychological Medicine*, 44, 1005–1013.
- Venables, N. C., Sellbom, M., Sourander, A., Kendler, K. S., Joiner, T. E., Drislane, L. E., et al. (2015). Separate and interactive contributions of weak inhibitory control and threat sensitivity to prediction of suicide risk. *Psychiatry Research*, 226, 461–466.
- Verona, E., Hicks, B. M., & Patrick, C. J. (2005). Psychopathy and suicidality in female offenders: Mediating influences of personality and abuse. *Journal of Consulting and Clinical Psychology*, 73, 1065–1073.
- Verona, E., Patrick, C. J., & Joiner, T. E. (2001). Psychopathy, antisocial personality, and suicide risk. *Journal of Abnormal Psychology*, 110, 462–470.
- Ward, J. H. (1963). Hierarchical grouping to optimize an objective function. Journal of the American Statistical Association, 58, 236–244.
- Widiger, T. A. (2006). Pyschopathy and DSM-IV psychopathology. In C. J. Patrick (Ed.), Handbook of psychopathy (pp. 156–171). New York: Guilford Press.
- Wright, A. G. C., & Simms, L. J. (2014). On the structure of personality disorder traits: Conjoint analyses of the CAT-PD, PID-5, and NEO-PI-3 trait models. *Personality Disorders: Theory, Research, and Treatment*, 5, 43–54.

# PART IV

# ETIOLOGY AND MECHANISMS OF PSYCHOPATHY

### CHAPTER 14

# Genetic and Environmental Influences on Psychopathy and Antisocial Behavior

IRWIN D. WALDMAN SOO HYUN RHEE DEVON LOPARO YUNSOO PARK

here are many research approaches to illuminating and understanding the etiology of disorders such as psychopathy and antisocial behavior, or trait dispositions associated with these conditions. Behavior genetic designs are advantageous for disentangling genetic and environmental influences (i.e., effects of nature and nurture), and characterizing their relative magnitudes as an important first step in characterizing etiology, to be followed by work directed at identifying specific candidate genes and environmental risk factors. Although it is not possible to disentangle genetic from environmental influences in family studies because influences of these types are inherently confounded in nuclear families, twin and adoption studies have the unique ability to disentangle genetic and environmental influences and to estimate the magnitude of each simultaneously. In this chapter, we summarize the existing literature on genetic and environmental contributions to psychopathy and antisocial behavior. Following a brief review of important concepts and methods underlying behavior genetic designs, we present the results of a meta-analysis of twin and adoption studies of antisocial behavior and psychopathy (Rhee & Waldman, 2002), followed by a summary of the growing behavior genetic literature on psy-

chopathy, including recent studies that examine the etiology of psychopathy-relevant traits such as callous-unemotional (CU) traits, narcissism, and impulsivity. We then review the literature on molecular genetic studies of antisocial behavior and psychopathy, focusing on both candidate gene studies and newer genomewide approaches. We conclude with some future directions for research on the genetic and environmental influences underlying psychopathy and antisocial behavior. These include the selection of relevant genetic risk factors as specific etiological mechanisms, and the use of endophenotypes to help find genes for psychopathy and antisocial behavior, and explain the biopsychological mechanisms underlying their effects.

#### Meta-Analysis of Twin and Adoption Studies on Antisocial Behavior

A meta-analysis of 51 twin and adoption studies was conducted in order to provide a clear, comprehensive picture of the magnitude of genetic and environmental influences on antisocial behavior (Rhee & Waldman, 2002). The operationalizations of antisocial behavior included psychiatric diagnoses, such as antisocial personality disorder (ASPD) and conduct disorder (CD); violation of legal or social norms, as manifested by criminality and delinquency; aggressive behavior; and an omnibus operationalization that included both aggression and delinquency items, such as the externalizing scale from the Child Behavior Checklist (Achenbach & Edelbrock, 1983). It was not as clear whether studies examining psychopathy should be included in the operationalization of clinical diagnoses, as some researchers emphasize the difference between DSM criteria and the traditional concept of psychopathy, noting that DSM criteria for ASPD focus on antisocial behavior, while the traditional concept of psychopathy focuses on personality traits (e.g., Hare, Hart, & Harpur, 1991). Given evidence that psychopathy measures and DSM criteria are related (e.g., Cooney, Kadden, & Litt, 1990; Taylor, McGue, Iacono, & Lykken, 2000), psychopathy measures were included as an operationalization of diagnosis. Nonetheless, given the concern that psychopathy and ASPD are not synonymous (e.g., Hare et al., 1991), the meta-analysis was repeated after excluding studies examining psychopathy to examine the impact of such studies on the results. We also conducted a separate meta-analysis of the seven behavior genetic studies examining psychopathy alone for purposes of comparison.

#### Studies Included in the Meta-Analysis

One hundred forty-one twin and adoption studies examining antisocial behavior were identified by using search terms shown in Appendix 14.1, examining references from studies and review articles, and searching for unpublished manuscripts or manuscripts in press by examining pertinent review articles, the abstracts of the Behavior Genetics Association meetings, and the Dissertations Abstracts and ERIC databases. After excluding unsuitable studies and addressing the problem of nonindependence, 51 studies (i.e., 10 independent adoption samples and 42 independent twin samples [two separate samples were examined in Eley, Lichtenstein, & Stevenson, 1999]) remained.

A study was included if it was clearly evident that the study examined ASPD, CD, criminality, aggression, or antisocial behavior (an omnibus operationalization including both delinquency and aggression items), if there was empirical evidence that the measure of antisocial behavior used successfully discriminated between an antisocial group and a control group, or if the measure was significantly related to a more established operationalization of antisocial behavior. Studies were excluded if these effect sizes were not reported or if there was not enough information to calculate the effect sizes, or if assessment of other disorders interfered with the assessment of antisocial behavior (e.g., with alcoholism or drug abuse being counted as antisocial behavior). If data from the same sample were reported more than once, the effect size from the largest sample was used, or the average of the multiple effect sizes was used in cases in which the sample size was identical across the nonindependent samples.

#### **Biometric Model-Fitting Analyses**

In behavioral genetic analyses, alternative models containing different sets of causal influences are compared for their fit to the observed data (i.e., twin or familial correlations or covariances). These models posit that antisocial behavior is affected by different types of influences: additive genetic influences (A-genetic influences in which alleles from different genetic loci are independent and "add up" to influence the liability for a trait), nonadditive genetic influences (D-genetic influences in which alleles interact with each other to influence the liability for a trait, either at a single genetic locus or at different loci), shared environmental influences (C-environmental influences experienced in common by family members that make them similar to one another), and nonshared environmental influences (E-environmental influences experienced uniquely by family members that make them different from one another).  $a^2$ ,  $d^2$ ,  $c^2$ , and  $e^2$  are the magnitude of additive genetic influences, nonadditive genetic influences, shared environmental influences, and nonshared environmental influences, respectively.

The effect sizes from each study were entered in separate groups in the model-fitting program Mx (Neale, 1995). In the model-fitting program, the correlations between pairs of relatives are explained in terms of the components of variance that are shared between the relatives (A, C, or D). Nonshared environmental influences, or E, do not explain any part of the correlation between relatives because, by definition, nonshared environmental influences are not shared between relatives. The correlation between different types of relatives is explained by different sets of influences and their appropriate weights, as shown in Appendix 14.2. These weights reflect the genetic or environmental similarity between pairs of relatives.

The analyses were performed in a series of steps. First, the analyses were conducted for all data appropriate for the meta-analysis, and five alternative models (the ACDE model, the ACE model, the AE model, the CE model, and the ADE model) were compared. The fit of each model was assessed using the  $\chi^2$  statistic and the Akaike information criterion (AIC), a fit index that reflects both the fit of the model and its parsimony (Loehlin, 1992). Among competing models, that with the lowest AIC and the lowest  $\chi^2$  relative to its degrees of freedom is considered to be the best-fitting model.

It is not possible to estimate  $c^2$  and  $d^2$  simultaneously or to test an ACDE model with data only from twin pairs reared together because the estimation of  $c^2$  and  $d^2$  both rely on the same information (i.e., the difference between the monozygotic [MZ] and dizygotic [DZ] twin correlations). If certain other types of data, such as the correlations between adoptees and their adoptive and biological parents, also are included in the analyses, this additional source of information allows for the simultaneous estimation of  $c^2$  and  $d^2$ , and the ACDE model can be tested. Therefore, it was only possible to test the ACDE model when analyzing all of the data included in the meta-analysis.

#### Meta-Analysis Results

The results of analyses of data from all of the samples meeting the inclusion criteria (N = 52 samples; 149 groups; 55,525 pairs of participants) are presented in Table 14.1. The full ACDE model fit

best as compared with the other, more restrictive models, suggesting that additive genetic (32%), nonadditive genetic (9%), shared environmental (16%), and nonshared environmental influences (43%) have significant influences on antisocial behavior. Parameter estimates did not differ after excluding studies that examined psychopathy (seven samples).

Results differed for the meta-analysis of data from studies of psychopathy alone. All seven of the studies examined psychopathy via self-report, and included five samples of reared-together twins, one sample of reared-apart twins, and one adoption sample that provided correlations between adoptees and their biological parents. Given the small number of samples, and the presence of only one parent-offspring adoption sample, it was not possible to estimate the full ACDE model. As shown in the bottom of Table 14.1, the estimates of  $c^2$  and  $d^2$  were near zero, and the fit of the ACE and ADE models were therefore no better than that of the AE model, which was the best-fitting model. Additive genetic influences accounted for 52% of the variance, and nonshared environmental influences accounted for the remaining 48% of the variance in self-reports of psychopathy. Additive genetic influences were clearly more important than shared environmental influences in explaining the familiality of psychopathy, as the CE model (which omits genetic influences) did not fit the data well.

TABLE 14.1. Standardized Parameter Estimates and Fit Statistics: Inclusion of All Data

	Pa	rametei	estim	ates		Fit s	tatistics	
	<i>a</i> <sup>2</sup>	<i>c</i> <sup>2</sup>	<i>e</i> <sup>2</sup>	$d^2$	$\chi^2$	df	Þ	AIC
ACDE model	.32	.16	.43	.09	1394.46	146	< .001	1102.46
ACE model	.38	.18	.44	_	1420.38	147	< .001	1126.38
ADE model	.41	_	.42	.17	1590.58	147	< .001	1296.58
AE model	.55	_	.45	_	1707.89	148	< .001	1411.89
CE model	—	.45	.55	—	2364.90	148	< .001	2068.90
		Data fi	om stu	idies of	psychopath	y only		
ACE model	.48	.04	.48	.00	26.29	13	.02	0.29
ADE model	.50	.00	.48	.02	26.76	13	.01	0.76
AE model	.52	_	.48		26.78	14	.02	-1.22
CE model	_	.42	.58	_	81.36	14	< .01	53.36

#### Results of More Recent Behavior Genetic Studies of Psychopathic Traits

Since the completion of Rhee and Waldman's (2002) meta-analysis, several published twin studies of psychopathic personality traits have reported similar findings. Blonigen, Carlson, Krueger, and Patrick (2003) used data from an adult male twin sample from Minnesota (165 MZ and 106 DZ twin pairs) to estimate genetic and environmental influences on the total score and eight subscales of the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996). The PPI subscales include Machiavellian Egocentricity, Social Potency, Fearlessness, Coldheartedness, Impulsive Nonconformity, Blame Externalization, Carefree Nonplanfulness, and Stress Immunity. The bestfitting model for the etiology of each of the subscales included genetic and nonshared environmental influences, with no evidence for shared environmental influences on any of the subscales. The genetic influences appeared to be nonadditive for all of the subscales except for the Social Potency and Blame Externalization, for which the genetic influences were additive. Genetic influences accounted for 29–56% of the variance in the differing PPI subscales.

Another study by Taylor, Loney, Bobadilla, Iacono, and McGue (2003) estimated genetic and environmental influences on the two six-item subscales (Antisocial and Detachment) of the Minnesota Temperament Inventory in two twin cohorts, ages 16-18, from the Minnesota Twin Family Study (cohort 1: 142 MZ and 70 DZ twin pairs; cohort 2: 128 MZ and 58 DZ twin pairs). For both scales, it was possible to constrain the parameter estimates to be equal across cohorts and thus fit the models to both cohorts simultaneously. The best-fitting model for both scales was the AE model, with additive genetic influences accounting for 39 and 42%, and non-shared environmental influences accounting for the remaining 61 and 58% of the variance in the Antisocial and Detachment scales, respectively. There was no evidence for shared environmental influences on either of the scales. Additive genetic influences accounted for 53% and nonshared environmental influences accounted for the remaining 47% of the covariation between the two psychopathy-related traits. Approximately 55% of the genetic influences and 79% of the nonshared environmental influences on Detachment were shared in common with those that also influence the Antisocial scale. This indicates that whereas the vast majority of the nonshared environmental influences on Detachment are the same as those on Antisociality, just under half of the genetic influences on Detachment are the same as those on Antisociality, suggesting a sizable portion of genetic influences unique to each psychopathy trait.

Viding, Blair, Moffitt, and Plomin (2005) examined genetic and environmental influences on antisocial behavior and on the callous-unemotional traits germane to psychopathy, as well as the extent to which the genetic and environmental influences on antisocial behavior varied as a function of CU trait levels, in a sample of 3,487, 7-year-old twin pairs in the United Kingdom. The authors first selected probands exhibiting extremely high scores on the antisocial behavior and CU dimensions, then estimated genetic and environmental influences on extreme status on each. There was moderate heritability ( $h_{\sigma}^2 = .67$ ) of extreme CU group status, which in turn moderated the heritability of antisocial behavior. Specifically, extreme antisocial behavior group status was highly heritable ( $h_{\sigma}^2 = .81$ ), with no evidence for shared environmental influences when accompanied by extreme CU group status, whereas extreme antisocial behavior group status was only modestly heritable  $(h_g^2 = .30)$ , with similar levels of shared environmental influences ( $c_g^2 = .34$ ) when not accompanied by extreme CU group status. These results suggest that CU psychopathic traits are moderately to highly heritable and may identify a subtype of antisocial behavior that is highly heritable even in childhood.

Larsson, Andershed, and Lichtenstein (2006) examined 1,063 Swedish adolescent twin pairs assessed using the Youth Psychopathy Inventory (YPI; Andershed, Kerr, Stattin, & Levander, 2002). This study used a multidimensional approach to psychopathic traits by characterizing levels on the Grandiose-Manipulative (G-M), Callous-Unemotional (C-U), and Impulsive-Irresponsible (I-I) subscales. The researchers examined the extent to which these three subscales indexed a general overarching trait of psychopathy-reflecting what all three subscales share in common-and estimated the magnitude of genetic and environmental influences on the higher-order trait of psychopathy, as well as on each of the three subscales uniquely. Larsson and colleagues found that the general psychopathy trait was most strongly indicated by G-M (factor loading = .75), followed by I-I (.49), then C-U (.33), and that the etiology of the overarching psychopathy trait included additive genetic and nonshared environmental influences, with no evidence for shared environmental influences ( $a^2 = .63$  and  $e^2 = .37$ ). Almost all of the additive genetic influences on G-M were those on general psychopathy rather than those acting on G-M directly ( $a^2 = .48$  vs.  $a^2 = .01$ ), whereas ~60% of its non-shared environmental influences were those on general psychopathy and ~40% acted on G-M directly ( $e^2 = .27$  vs.  $e^2 = .17$ ). Shared environmental influences acted on G-M directly but were minimal and nonsignificant ( $c^2 = .06$ ). For C-U, half of its additive genetic influences were those on general psychopathy and half acted on C-U directly ( $a^2 = .21$  vs.  $a^2 = .22$ ), whereas ~20% of its non-shared environmental influences were those on general psychopathy and ~80% acted on C-U directly ( $e^2 = .12$  vs.  $e^2 = .45$ ). There was no evidence for shared environmental influences on C-U. Finally, for I-I, ~60% of its additive genetic influences were those on general psychopathy and ~40% acted on I-I directly ( $a^2 = .31$  vs.  $a^2 = .22$ ), whereas ~40% of its nonshared environmental influences were those on general psychopathy and ~60% acted on I-I directly ( $e^2 = .18$  vs.  $e^2 = .28$ ). Similar to C-U and general psychopathy, there was no evidence for shared environmental influences on I-I.

In a 3-year follow-up of this sample, Forsman, Lichtenstein, Andershed, and Larsson (2008) showed that almost all of the stability of the overarching psychopathy trait was due to common additive genetic influences at both ages (i.e., 16 and 19 years old). Analogously, almost all of the stability of G-M was due to common additive genetic influences on general psychopathy at both ages, whereas the stability of C-U and I-I were attributable mainly to additive genetic influences that acted directly on each subscale. In this same sample, Forsman, Lichtenstein, Andershed, and Larsson (2010) also showed that psychopathic personality in midadolescence predicted antisocial behavior in adulthood, but not the other way around, and that ~3% of the genetic variance in adult antisocial behavior was due to earlier genetic effects on psychopathic personality in midadolescence. Nonetheless, there were bidirectional effects when using a measure of persistent antisocial behavior (from ages 8–9 to ages 16–17).

Another twin study by Fontaine, Rijsdijk, Mc-Crory, and Viding (2010) investigated genetic and environmental contributions to the development of CU traits from childhood to early adolescence in a sample of 9,462 youth from the Twins Early Development Study (TEDS), a population-based sample of twins from the United Kingdom. CU traits were assessed at ages 7, 9, and 12 using three items from the Antisocial Process Screening Device (APSD; Frick & Hare, 2001) and four items from the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). Four distinct trajectories of CU were found through growth mixture modeling: stable-high, increasing, decreasing, and stable-low. In general, trajectory-group membership was primarily driven by genetic and-to a lesser extent-nonshared environmental influences. There were sex differences in all but one of the trajectory groups (i.e., in the stable-high, increasing, and decreasing groups, but not the stable-low group), such that trajectory group membership was influenced by additive genetic factors in boys and shared environmental factors in girls. Membership in the stable-low trajectory group was primarily determined by additive genetic influences ( $a^2 = .68$ ). For boys, there were considerable additive genetic influences on all CU trajectories ( $a^2 = .58 - .78$  vs. in girls:  $a^2 = .00-.68$ ), with the stable-high CU trajectory showing highest heritability ( $a^2 = .78$  in boys vs. .00 in girls). Nonetheless, for girls, there was a stronger contribution of shared environment particularly in the stable-high ( $c^2 = .75$  in girls vs. .01 in boys) and increasing ( $c^2 = .47$  in girls vs. .03 in boys) trajectory groups.

In another study, Bezdjian, Raine, Baker, and Lynam (2011) investigated the underlying factor structure of psychopathic personality traits in children, as well as genetic and environmental influences on these traits, in a community sample of 1,219 twins and triplets using an extended version of the Child Psychopathy Scale (CPS; Lynam, 1997, 2002). The authors found an optimal twofactor solution consisting of callous/disinhibited and manipulative/deceitful factors using both exploratory factor analyses (EFAs) and confirmatory factor analyses (CFAs). Furthermore, they found genetic and nonshared environmental influences for both CPS composite factors, as well as sex differences, such that in boys, there were higher heritability estimates for callous/disinhibited traits and lower heritability estimates for manipulative/ deceitful traits. Specifically, in boys, the heritability estimates were  $a^2 = .64$  and .46 for the callous/ disinhibited and manipulative/deceitful traits, respectively, and in girls,  $a^2 = .49$  and .58, respectively. Furthermore, in boys, nonshared environmental estimates were  $e^2 = .36$  and .53 for the callous/ disinhibited and manipulative/deceitful traits, respectively, and in girls,  $e^2 = .44$  and .37, respectively. Shared environmental influences were negligible for both traits ( $c^2 = .00$  and .06, respectively). In addition, bivariate analyses indicated common genetic and nonshared environmental influences, but not shared environmental influences, on the covariation between the two CPS factors.
Most recently, Ficks, Dong, and Waldman (2014) examined sex differences in the genetic and environmental influences on three psychopathic trait dimensions (i.e., CU, Narcissism, and Impulsivity) using the APSD (Frick & Hare, 2001) in a sample of 885 twin pairs. For CU and Narcissism, there were moderate additive genetic (CU:  $a^2 = .49$ ; Narcissism:  $a^2 = .63$ ) and nonshared environmental influences (CU:  $e^2 = .32$ ; Narcissism:  $e^2 = .37$ ), with modest shared environmental influences for CU ( $c^2 = .19$ ) and negligible shared environmental influences for Narcissism ( $c^2$  = .00). Additive and nonadditive genetic influences contributed ~60-75% of the variance in Impulsivity, with non-shared environmental influences contributing the remaining variance. Although the magnitude of the genetic and environmental influences underlying CU and Narcissism did not differ across sex, nonshared environmental influences accounted for a greater proportion of the total variance in impulsivity in boys. Furthermore, there was no evidence of qualitative sex differences in the etiology of psychopathic traits, suggesting that the same genes and environments contribute to these psychopathic traits in boys and girls.

It is worth noting that in both the Rhee and Waldman (2002) meta-analysis and more recent behavior genetic studies of psychopathy, antisocial behavior seems to have a higher heritability when accompanied by CU than when it is not. Relatedly, recent work has distinguished between the etiology of aggressive versus nonaggressive expressions of antisocial behavior (e.g., Burt, 2009). Aggressive antisocial behavior seems to have a higher heritability than rule-breaking antisocial behavior (Burt, 2009), and the etiological distinction between the two seems to be driven by two differentiable genetic factors in both children (Kendler, Aggen, & Patrick, 2013) and adults (Kendler, Aggen & Patrick, 2012). More work is needed to determine the degree of similarity between the heritable aspects of psychopathy and aggressive antisocial behavior.

# Molecular Genetic Studies of Antisocial Behavior and Psychopathy

Broadly speaking, there are two general strategies for identifying genes that contribute to the etiology of a disorder or trait: candidate gene studies and genomewide studies (genome scan and genomewide association studies). We first describe the candidate gene approach and review the literature on candidate gene studies of antisocial behavior and psychopathy. Following this, we describe genomewide approaches and review the first wave of such studies addressing these clinical conditions.

#### Candidate Genes for Antisocial Behavior and Psychopathy

One strategy for identifying genes that contribute to the etiology of a disorder is the candidate gene approach. In many ways, candidate gene studies are polar opposites of genome scans. In contrast to the exploratory nature of genome scans, wellconducted candidate gene studies represent a targeted test of the role of specific genes in the etiology of a disorder as the location, function, and etiological relevance of candidate genes is most often known or strongly hypothesized a priori. Thus, an advantage of well-conducted candidate gene studies in comparison with genome scans is that positive findings are easily interpretable because one already knows the gene's location, function, and etiological relevance, even if the specific polymorphism(s) chosen for study in the candidate gene is not functional and the functional mutation(s) in the candidate gene is as yet unidentified. However, there are also disadvantages to the candidate gene approach given that only previously identified genes can be studied. Thus, one cannot find genes that have not been looked for previously or have yet to be discovered, and because there are relatively few strong candidate genes for psychiatric disorders, the same genes tend to be examined as candidates for almost all psychiatric disorders, regardless of how disparate the disorders may be in terms of their symptomatology or conjectured pathophysiology. In welldesigned studies, however, knowledge regarding the biology of the disorder is used to select genes based on the known or hypothesized involvement of their gene product in the etiology of the trait or disorder (i.e., its pathophysiological function and etiological relevance).

With respect to antisocial behavior and psychopathy, a contribution of genes underlying various aspects of the dopaminergic and serotonergic neurotransmitter pathways may be conjectured based on several lines of converging evidence suggesting a role for these neurotransmitter systems in the etiology and pathophysiology of these traits and their relevant disorders. For example, there is considerable overlap between antisocial behavior and childhood ADHD (e.g., Lilienfeld & Waldman, 1990), and thus candidate genes for ADHD may also be relevant candidates for antisocial behavior and psychopathy. Several genes within the dopamine system appear to be risk factors for ADHD (for recent reviews, see Gizer, Ficks, & Waldman, 2009; Waldman & Gizer, 2006). Dopamine genes are plausible candidates for attention-deficit/hyperactivity disorder (ADHD) given that stimulant medications that are the most frequent and effective treatments for ADHD appear to act primarily by regulating dopamine levels in the brain (Seeman & Madras, 1998; Solanto, 1984), and also affect noradrenergic and serotonergic function (Solanto, 1998). In addition, "knockout" gene studies in mice, in which the behavioral effects of the deactivation of specific genes are examined, have further demonstrated the potential relevance of genes within these neurotransmitter systems. Results of such studies have markedly strengthened the consideration as candidate genes for ADHD of genes within the dopaminergic system, such as the dopamine transporter gene (DAT1; Giros, Jaber, Jones, Wightman, & Caron, 1996) and the dopamine receptor D3 and D4 genes (DRD3 and DRD4; Accili et al., 1996; Dulawa, Grandy, Low, Paulus, & Geyer, 1999; Rubinstein et al., 1997), as well as genes within the serotonergic system, such as the seroton in 1 $\beta$  receptor gene (HTR1 $\beta$ ; Saudou et al., 1994). Serotonergic genes also are plausible candidates for antisocial behavior and psychopathy given the demonstrated relations between serotonergic function and aggression and violence (Berman, Kavoussi, & Coccaro, 1997).

Candidate genes for neurotransmitter systems may include (1) precursor genes that affect the rate at which neurotransmitters are produced from precursor amino acids (e.g., tyrosine hydroxylase for dopamine, tryptophan hydroxylase for serotonin); (2) receptor genes that are involved in receiving neurotransmitter signals (e.g., genes corresponding to the five dopamine receptors, DRD1, D2, D3, D4, and D5, and to the serotonin receptors, such as HTR1 $\beta$  and HTR2A); (3) transporter genes that are involved in the reuptake of neurotransmitters back into the presynaptic terminal (e.g., the dopamine and serotonin transporter genes, DAT1 and 5HTT); (4) metabolite genes that are involved in the metabolism or degradation of these neurotransmitters (e.g., the genes for catechol-Omethyltransferase [COMT], and for monoamine oxidase A and B [i.e., MAOA and MAOB]), and (5) genes that are responsible for the conversion of one neurotransmitter into another (e.g., dopamine beta hydroxylase, or  $D\beta H$ , which converts dopamine into norepinephrine).

#### *Studies of Dopaminergic Genes and Antisocial Behavior and Psychopathic Traits*

Evaluations of dopaminergic candidate genes in humans have yielded results that are quite mixed. Three studies of a variable number of tandem repeats (VNTR) in DAT1 in community samples have produced contradictory results. One study showed no association between DAT1 and aggression or ODD or CD symptoms (Jorm et al., 2001). Regarding the other two studies, the first showed an association between the 9-repeat allele and externalizing problems (Young et al., 2002), whereas the other study showed an association of the 10-repeat allele with adolescent-onset nonaggressive (rule-breaking) antisocial behavior (Burt & Mikolajewski, 2008). Several studies have used subsamples from the National Longitudinal Study of Adolescent Health (Add Health) comprising ~2,500 adolescents and young adults to examine associations of antisocial behavior and psychopathic traits with various dopaminergic genes, including DAT1, the TaqIA polymorphism in the dopamine D2 gene (DRD2), and a VNTR in the third exon of DRD4. One study found an association between DAT1 and pathological criminal behavior (Vaughn, DeLisi, Beaver, & Wright, 2009). Another study found associations for DAT1 and DRD2 with serious and violent delinquency in males, but not in females (Guo, Roettger, & Shih, 2007). In the third study, Wu and Barnes (2013) found that DRD2 and DRD4, but not DAT1, were associated with psychopathic personality traits. However, another study using a subset (872 males) of the Add Health sample, as well as two other studies using different samples, found no association for either DRD2 or DRD4 with CD or antisocial behavior (Beaver et al., 2007; Prichard, Jorm, Mackinnon, & Easteal, 2007; Schmidt, Fox, & Hamer, 2007).

Very few association studies of antisocial behavior and psychopathic traits with dopaminergic or noradrenergic genes have been conducted in clinic-referred samples. Holmes and colleagues (2002) found that *DRD4* was related to ADHD only when accompanied by CD. In a longitudinal study, Lahey and colleagues (2011) found that *DAT1* was associated with youth reports, but not parent reports, of CD symptoms across ages 9–14 in youth with ADHD. In addition, *DAT1* has been found to be associated with ASPD in alcohol-dependent individuals (Reese et al., 2010), as well as in heroindependent individuals (Yang, Kavi, Wang, Wu, & Hao, 2012). In samples of alcohol-dependent male adults, DRD2 has also been found to be associated with psychopathic traits (Ponce et al., 2008), but not ASPD (Lu et al., 2012). Finally, a commonly studied functional single-nucleotide polymorphism (SNP) in COMT was associated with antisocial behavior in a sample of children referred for ADHD, as well as in two non-referred community samples, and this association was particularly strong for children of low birthweight (Caspi et al., 2008; Thapar et al., 2005). COMT was also found to be associated with CD in a sample of male adolescent inmates (DeYoung et al., 2010). Furthermore, another study focusing on adolescents with ADHD (Fowler et al., 2009) found an association between COMT and "emotional dysfunction" (i.e., deficient affective experience; Cooke & Michie, 2001) features of psychopathy as indexed by the Hare Psychopathy Checklist: Youth Version (PCL:YV; Forth, Kosson, & Hare, 2003), with no association evident for total psychopathy scores.

#### *Studies of Serotonergic Genes and Antisocial Behavior and Psychopathic Traits*

Serotonergic genes also are plausible candidates for antisocial behavior and psychopathy given the demonstrated relationship between serotonergic function and violent/aggressive behavior (Berman et al., 1997; Kruesi et al., 1990). Several researchers have tested for associations of aggression and antisocial behavior with candidate genes in the serotonergic system, including the serotonin transporter gene (5HTT), the 1 $\beta$  receptor gene (HTR1 $\beta$ ), the tryptophan hydroxylase genes (TPH1 and TPH2), and MAOA. However, despite the reported effects on aggression of gene knockouts for 5HTT, HTR1 $\beta$ , and MAOA in mice (Cases et al., 1995; Holmes, Murphy, & Crawley, 2003; Saudou et al., 1994) and evidence for effects of functional polymorphisms in these genes (5HTT and MAOA, in particular) on aggressive behavior in differing animal species (Takahashi, Quadros, de Almeida, & Miczek, 2012), findings of associations for these genes with aggression and antisocial behavior phenotypes in humans are quite mixed (for 5HTT: Baca-Garcia et al., 2004; Beitchman et al., 2006; Cadoret et al., 2003; Davidge et al., 2004; Ha et al., 2005; Kweon et al., 2005; Retz, Retz-Junginger, Supprian, Thome, & Rösler, 2004; for HTR1B: New et al., 2001; for TPH1: Hennig, Reuter, Netter, Burk, & Landt, 2005; Koh, Kim, Choi, Lee, & Seo, 2012; Manuck et al., 2000; New et al., 2001; Staner et al., 2002; for MAOA: Caspi et al., 2002; Eisenberger, Way, Taylor, Welch, & Lieberman, 2007; Foley et al., 2004; Haberstick et al., 2005; Huang et al., 2004; Huizinga et al., 2006; Kim-Cohen et al., 2006; Manuck et al., 2000; Nilsson et al., 2006; Young et al., 2006). A meta-analysis of candidate gene studies of aggression and violence that included data from five studies of HTR1 $\beta$ , 19 studies of 5HTT, 17 studies of MAOA, and five studies of TPH1 (Vassos, Collier, & Fazel, 2013) found that no serotonergic genes were significantly related to aggression or violence in general, though MAOA was associated with violence in males with a history of violence (p = .02) and 5HTT was associated with aggression in adults (p = .02) and substance users (p = .009). However, a more recent meta-analysis found significant associations for functional markers in the promoter regions of MAOA (31 studies) and 5-HTT genes (18 studies) with antisocial behavior across existing studies, with odds ratios of 1.14 and 1.53, respectively (Ficks & Waldman, 2014). Furthermore, recent research has provided evidence that markers in MAOA and 5HTT are related to psychopathy and CU traits (Fowler et al., 2009; Sadeh et al., 2010).

In summary, available evidence suggests that serotonergic genes are modestly involved in the etiology of antisocial behavior and psychopathy, though the specific mechanisms and contributions of particular genes across phenotypes are unclear. In further research of this type, we believe it will be important for researchers to examine multiple markers in each gene to rigorously evaluate the robustness and specificity of their associations with antisocial behavior and psychopathy.

#### Studies of Neuropeptide Genes and Antisocial Behavior and Psychopathic Traits

Genes that underlie the neuropeptides oxytocin and vasopressin are also viable candidates for aggression and antisocial behavior given the role of these genes in influencing aggression in knockout mice (for oxytocin [OXT] and its receptor [OXTR], see DeVries, Young, & Nelson, 1997; Takayanagi et al., 2005; for the vasopressin receptor 1a and 1b genes [AVPR1a, AVPR1b], see Ferris et al., 1997; Wersinger, Ginns, O'Carroll, Lolait, & Young, 2002). In addition to these molecular genetic studies, the role of vasopressin in aggression is suggested by a cross-fostering study in mice (Bester-Meredith & Marler, 2001) and by pharmacological challenge studies in hamsters (Ferris et al., 2006) and humans (Coccaro, Kavoussi, Hauger, Cooper, & Ferris, 1998; Thompson, Gupta, Miller, Mills, & Orr, 2004). These studies also have suggested important interactions between these neuropeptides and serotonergic function (Coccaro et al., 1998), suggesting the possibility of interplay between genes in these systems. For example, recent research by Finnish investigators has demonstrated that OXTR markers interact with alcohol to increase risk for aggression, both in young adults tested in a laboratory task (Johansson, Bergman, et al., 2012), and in a broader population sample assessed using survey measures (Johansson, Westberg, et al., 2012). Further analyses of data from the laboratory task in the first of these studies, utilizing a gene-based test of association, revealed a main effect of OXTR that accounted for 1-2% of the variance in a latent aggression trait (LoParo et al., 2016). Consistent with this, another recent study found main effects of several OXTR variants (but not OXT variants) on aggression in children (Malik, Zai, Abu, Nowrouzi, & Beitchman, 2012). Two other studies have examined associations between OXTR and OXT variants and CU traits (Beitchman et al., 2012; Malik et al., 2012). The first of these found that a single OXTR variant was related to CU traits, whereas the second found no associations for OXTR or OXT variants with CU traits. Furthermore, no studies to date have found a relationship between vasopressin receptor genes and antisocial behavior or psychopathy (Bachner-Melman et al., 2005). Thus, research on the contribution of neuropeptide genes to antisocial behavior is promising but preliminary, and it is not yet possible to draw conclusions about their associations.

#### Genomewide Studies of Antisocial Behavior and Psychopathy

Another general strategy for identifying genes that contribute to a clinical condition is the genomewide analysis approach. One such approach entails genome scan analyses, in which linkage is examined between a disorder or trait and evenly spaced DNA markers (approximately 10,000 base pairs apart) distributed across the entire genome (Haines, 1998). Another technique entails genomewide association studies (GWAS), in which associations are tested between a trait or disorder and a dense set of SNPs, which have numbered upwards of 1 million in recent GWAS microarrays.

Genome scans may be thought of as exploratory searches for putative genes that contribute to the etiology of a disorder. Evidence for linkage between any of the DNA markers and the trait or disorder of interest in a genome scan implicates a broad segment of the genome that may contain hundreds of genes, and lack of evidence for linkage can, in rare cases, be used to exclude genomic segments. Subsequent fine-grained association analyses can then use a new set of more tightly grouped markers within the implicated genomic region to locate the functional mutation. However, genome scans using linkage have largely fallen out of favor over the past 10 years given the technological innovations that have produced ever more dense SNP microarrays, as well as the concomitant sharp drop in the price of such microarrays per participant.

Over this same period, the technique of GWAS has grown in popularity. The fact that genes have been found for many medical conditions via GWAS is testament to the usefulness of this method (Visscher, Brown, McCarthy, & Yang, 2012). Unfortunately, the power of GWAS association analyses for a given sample is typically quite low to detect the effect sizes that appear to be commonplace for psychiatric disorders and psychological traits (i.e., odds ratios < 1.25, or  $r^2$  < .01) This makes it very difficult, if not impossible, to detect genetic markers that contribute to the etiology of a disorder or trait in a single study, leading to large-scale, multi-sample collaborative initiatives and meta-analyses of GWAS results from multiple samples.

Despite the low statistical power of association tests in genome scans with single samples of typically moderate size, a number of genome scans of antisocial behavior and psychopathy have been conducted to date using both linkage and association methods. Two genomewide linkage scans of retrospectively reported CD have been conducted using data from samples enriched for alcohol dependence (Dick et al., 2004; Kendler et al., 2006). Furthermore, several studies have been conducted involving genomewide linkage scans of antisocial behavior more broadly, such as a composite score of alcohol dependence, illicit drug dependence, childhood CD, adult ASPD, novelty seeking, and sensation seeking (Dick et al., 2008), a composite of substance dependence and CD symptoms (Stallings et al., 2005), and a composite of ASPD and CD (Ehlers, Gilder, Slutske, Lind, & Wilhelmsen, 2008). These studies have implicated several chromosomal regions as conferring risk for antisocial behavior, though effect sizes were modest, and none of these findings have led to the discovery of an associated gene in an implicated region. While no genomewide linkage scans of psychopathy per se have been undertaken to date, some GWAS studies of psychopathy have been conducted, along with GWAS studies focusing on antisocial behavior more broadly.

#### Findings from GWAS Investigations of Antisocial Behavior and Psychopathic Traits

As described earlier, the most commonly used genome scan method over the past 10 years has become the GWAS, a method that tests associations between a disorder or trait and DNA markers-typically SNPs-distributed across the genome. During the time in which this method has been applied to complex psychological disorders and traits, it has become clear that most disorders and traits-including antisocial behavior and psychopathy—are highly polygenic and likely to be influenced by many genes of small effect (Manolio et al., 2009). Concurrently, technological advances (reviewed by Visscher et al., 2012) have made it possible to genotype hundreds of thousands to millions of markers relatively inexpensively. Thus, large sample sizes are needed to detect small effects and to overcome the necessary correction for conducting potentially millions of statistical tests. Despite having low to moderate statistical power to detect markers with small effects, several GWASs of antisocial behavior and psychopathy have been conducted.

GWAS methods have not yet yielded replicable findings for antisocial behavior. A GWAS of CD diagnosis in 938 individuals with ADHD did not yield any genomewide significant results (Anney et al., 2008). A GWAS of retrospectively reported CD symptoms in 3,963 individuals found four markers that met criteria for genomewide significance, two of which were located in the gene CIQTNF7 (Dick et al., 2011). Subsequently, a GWAS of ASPD in 4,816 individuals (Tielbeek et al., 2012) failed to replicate findings from the Dick and colleagues (2011) study, and furthermore did not detect any genomewide significant markers. This study also used genomewide complex trait analysis (GCTA), a method for assessing heritability by estimating the proportion of variance of a trait explained by the additive effects of all genotyped SNPs (Yang, Lee, Goddard, & Visscher, 2011). The estimated heritability of ASPD in this sample was 0.55, though its standard error was 0.41; thus, the estimate was not significant (Tielbeek et al., 2012). Similarly, a study that used GCTA to estimate the heritability of conduct problems and psychopathy in children found nonsignificant heritability estimates that were close to zero (Trazsowski, Dale, & Plomin, 2013). The authors attributed the discrepancy between heritability estimates from twin samples and GCTA to nonadditive genetic influence, which is included in twin but not GCTA heritability estimates (Trazowski et al., 2013).

Most GWAS studies have not tested for multivariate associations across antisocial phenotypes, though one study that tested for associations with nicotine use, alcohol consumption, alcohol dependence, illicit drug use, and non-substancerelated behavioral disinhibition in 7,188 individuals clustered in 2,300 families found 13 SNPs demonstrating genomewide significant associations across multiple phenotypes (McGue et al., 2013). GCTA was used in this sample to estimate heritability, which ranged from 0.08 to 0.37 for the five phenotypes (McGue et al., 2013; Vrieze, McGue, Miller, Hicks, & Iacono, 2013). A recent study of behavioral disinhibition that genotyped only rare variants in exons of 7,181 individuals from this sample found no genomewide significant markers, and reported a GCTA-estimated heritability of 0.26 for behavioral disinhibition (Vrieze, Feng, et al., 2014). Together these results suggest that although antisocial behavior is heritable and genetic variants seem to explain some proportion of its variance in the aggregate, larger sample sizes are necessary to reliably detect individual genetic variants that truly increase risk.

Few studies have used GWAS methods to search for variants that increase risk for psychopathy. In fact, the two extant studies examined associations only for CU traits, and used the same participant sample (Viding et al., 2010, 2013). The first study used a DNA pooling method to search the genome for markers that increased risk for a combined antisocial behavior and CU phenotype in two samples of 300 children (Viding et al., 2010). This study reported no significant findings, though it only had sufficient power to detect markers of large effect. The second study used standard GWAS methods to find markers associated with CU traits in a sample of 2,930 children (Viding et al., 2013). This study also found no genomewide significant markers and reported a GCTA-estimated heritability of only 0.07 for CU traits, which was not significant.

Thus, there is insufficient research to make even tentative conclusions regarding the contributions of particular genetic markers to psychopathic traits. More research using a wider variety of psychopathy phenotypes and sample characteristics in larger samples is necessary.

## Endophenotypes for Antisocial Behavior and Psychopathy

Clearly, there is a large gap between the effects of genes and the manifest symptoms of disorders or traits such as antisocial behavior and psychopathy as typically assessed by interviews or rating scales. It is desirable from both a conceptual and empirical perspective to find valid and meaningful mediational or intervening constructs that may help to bridge this gap. The term "endophenotype" is often used to describe such constructs and the variables that are used to measure them. Endophenotypes were first described in relation to psychiatric disorders by Gottesman and Shields (1972) over 40 years ago in a book focusing on their application to the genetics of schizophrenia. In this context, these authors characterized endophenotypes as internal phenotypes discoverable by a biochemical test or microscopic examination (Gottesman & Gould, 2003; Gottesman & Shields, 1972). More generally, endophenotypes refer to constructs that are thought to underlie psychiatric disorders or relevant traits, and to be more directly influenced by the genes relevant to disorder than are the manifest symptoms. As such, they are closer to the immediate products of such genes (i.e., the proteins for which they code) and are thought to be more strongly influenced by the genes that underlie them than the manifest symptoms that they in turn undergird. Endophenotypes also are thought to be "genetically simpler" in their etiology than are complex traits such as manifest disorders or their symptom dimensions (Gottesman & Gould, 2003). This means that the underlying structure of genetic influences on endophenotypes is potentially simpler than that of complex disorders and traits—which means that there are likely to be fewer individual genes (or sets thereof) contributing to their etiology.

A number of researchers have outlined criteria for evaluating the validity and utility of putative endophenotypes (e.g., Castellanos & Tannock, 2002; Doyle et al., 2005; Gottesman & Gould, 2003; Waldman, 2005). These include the following: (1) The endophenotype is related to the disorder and its symptoms in the general population; (2) the endophenotype is heritable; (3) the endophenotype is expressed regardless of whether the disorder is present; (4) the endophenotype and disorder are associated within families (i.e., they "co-segregate"); and (5) in addition to the endophenotype occurring to a greater extent in family members with a disorder than in family members who are unaffected (i.e., criterion 4), it also will occur at a higher rate in the unaffected relatives of family members with a disorder than in randomly selected individuals from the general population (given that the endophenotype reflects the inherited liability to a disorder).

In addition to the foregoing requirements, several other criteria are pertinent to the validity and utility of endophenotypes. First, it is important that genetic influences that underlie the endophenotype also underlie the disorder or related trait, and that at least some (but likely not all) of the genetic influences that underlie the disorder or related trait underlie the endophenotype. Note that this last criterion is asymmetrical, in that a higher proportion of the genetic influences on the endophenotype will be shared in common with those with the disorder or related trait, rather than vice versa. This criterion follows from the notion mentioned previously that endophenotypes are thought to be more genetically simple than are complex traits such as disorders, in the sense that fewer genes contribute at greater levels to their etiology (Gottesman & Gould, 2003). Second, measures of the endophenotype must show association and/or linkage with one (or more) of the genes or genetic loci that underlie the disorder or related trait. Third, the endophenotype measure must mediate the association and/or linkage between the gene or genetic locus and the disorder or related trait, meaning that the effects of a particular gene or locus on a disorder or trait are expressed—either in full or in part—through the endophenotype. The prerequisites for this causal scenario are that the gene influences both the disorder or trait and the endophenotype, and that the endophenotype in turn influences the disorder or related trait. Fourth, the endophenotype should show association and linkage with a gene over and above the gene's relation with the disorder or related trait (i.e., the endophenotype should incrementally contribute to association with the candidate gene), and therefore aid in the search for genes that underlie the etiology of disorders or related traits.

Several biological, psychophysiological, and psychological mechanisms may be plausible candidates as putative endophenotypes for antisocial behavior and psychopathy. Putative biological endophenotypes may include serotonin and dopamine levels, given their aforementioned relations to antisocial behavior and psychopathy (Berman, Kavoussi, & Coccaro, 1997) and related disorders such as ADHD. Putative psychophysiological endophenotypes may include avoidance conditioning (Lykken, 1957) and startle probe response (Patrick, 1994), given findings of deficits in such variables in psychopathic relative to non-psychopathic individuals. Putative psychological endophenotypes may include hostile perceptual and attributional biases (Waldman, 1996), deficits and biases in the perception of facial emotions such as fear and sadness (Blair, 2006; Dadds et al., 2006; Dadds, El Masry, Wimalaweera, & Guastella, 2008), and executive function deficits (Morgan & Lilienfeld, 2000), given their demonstrated relations to aggression and antisocial behavior. Future studies examining the extent to which these variables meet the criteria outlined earlier are necessary for evaluating their validity and utility as putative endophenotypes for antisocial behavior and psychopathy. A recent set of studies has begun this process by using behavior genetic, GWAS, and gene sequencing methods to estimate the heritability of, and identify SNPs associated with, a set of putative endophenotypes, with some promising results (e.g., Vaidyanathan, Malone, Donnelly, et al., 2014; Vaidyanathan, Malone, Miller, McGue, & Iacono, 2014; Vrieze, Malone, et al., 2014).

### **Conclusions and Future Directions**

Findings from the meta-analysis of antisocial behavior we described at the outset indicate that there are moderate and significant additive genetic ( $a^2 = .32$ ), nonadditive genetic ( $d^2 = .09$ ), shared environmental ( $c^2 = .16$ ), and nonshared environmental influences ( $e^2 = .43$ ) on antisocial behavior. In contrast, results from a corresponding meta-analysis of earlier behavior genetic studies (i.e., up to 2002) focusing more specifically on psychopathy, along with findings from more recent twin studies reviewed following the meta-analysis section, suggest that genetic influences on psychopathic traits are appreciable, with moderate nonshared environmental influences but no evidence for shared environmental influences across studies. These studies raise the possibility that much of the genetic influences on the development of antisocial behavior are mediated via psychopathic personality traits, and raise the question as to what extent the heritability of psychopathic traits is coextensive with genetic influences on "normal range" personality traits such as negative and positive emotionality, constraint or inhibitory control, and daring or boldness (Benning, Patrick, Blonigen, Hicks, & Iacono, 2005; Lahey & Waldman, 2003; Patrick, Fowles, & Krueger, 2009; Waldman et al., 2011). Future directions for behavior genetic studies of antisocial behavior include multivariate analyses examining the magnitude of common or specific genetic and environmental influences on different operationalizations of antisocial behavior, further examination of the relations between psychopathic and "normal range" personality traits and antisocial behavior, and longitudinal studies examining the effects of age of onset and developmentally different subtypes on the genetic and environmental influences underlying antisocial behavior. Related to this last point, future studies should attempt to replicate the finding that the heritability of conduct problems is higher at more extreme CU levels (Viding et al., 2005), and evaluate whether the heritability of conduct problems is also higher with increased levels of other trait dispositions-including narcissism, boldness, impulsivity, or overall psychopathy. Researchers also should test whether-and to what extent-distinct dispositional subdimensions (or facets; Patrick & Drislane, 2015) of psychopathy are indicative of a general psychopathy construct both phenotypically and etiologically (Larsson et al., 2006), and whether a general psychopathy construct accounts for these distinguishable subdimensions to differing degrees across development (i.e., in childhood compared to adolescence relative to early and later adulthood).

A number of profitable future directions for molecular genetic studies of antisocial behavior and psychopathy may also be identified. Over the past decade, many researchers have documented the pitfalls of candidate gene studies, which has led to their increasing unpopularity and decreased use, including a misplaced focus on a priori specified neurobiological systems as the way to prioritize genes for study, small sample sizes, multiple testing without adequate error correction, lack of replication samples, and tests of only one or a handful of polymorphisms to represent a gene. For future candidate gene studies to have even a chance at being successful and convincing, they must use much larger samples-ideally including thousands rather than hundreds of participants, be much more judicious regarding the number of hypothesis tests conducted and appropriately control for false-positive rates and multiple testing, base the selection of candidate genes for examination more on empirical findings (e.g., from genome scans) rather than on theoretical hunches that have very low a priori odds of being correct, and routinely incorporate replication samples and undertake meta-analyses to combine results. In addition, researchers might benefit from a shift away from testing individual SNPs toward testing the contributions of genes-given that genes comprise more fundamental units of inheritance, that there are far fewer genes to test than there are SNPs (resulting in a much less stringent *p*-value threshold for significance; i.e.,  $2 \times 10^{-6}$  for genes as opposed to  $5 \times 10^{-8}$  for SNPs), and that effect sizes for genes are potentially larger than those for individual SNPs (Neale & Sham, 2004).

Although genome scans have come to be commonly used for identifying genes that underlie various medical conditions (Visscher et al., 2012) and psychiatric disorders such as schizophrenia (Ripke et al., 2013), use of GWAS and other genomewide methods such as GCTA to understand the genetic contributions to antisocial behavior and psychopathy is in its infancy. At present, there are no replicated genomewide significant findings for antisocial behavior or psychopathy, and GCTA results have accounted for only a minority of the twin-estimated heritability of antisocial behavior and psychopathy. Clearly, the next decade will see a vast increase in such studies of not only common variants but also rare variants (see, e.g., Vrieze, Feng, et al., 2014; Vrieze, Malone, et al., 2014), and at that point we will be in a much better position to assess the extent to which genomewide studies increase our understanding of the etiology of antisocial behavior and psychopathy. Such studies will benefit from not only very large samples and use of meta-analysis to combine results across individual studies but also the use of multivariate rather than univariate phenotype analyses and gene-based analytic approaches such as those we have described.

#### ACKNOWLEDGMENTS

This work was supported in part by National Institute of Mental Health (NIMH) Grant No. MH-01818. We thank the authors who made data from unpublished studies available through personal communication. We also thank Deborah Finkel, Jenae Neiderhiser, Wendy Slutske, and Edwin van den Oord for making the data from their studies available before publication, and Scott O. Lilienfeld, Kim Wallen, and Terrie E. Moffitt for helpful comments on earlier versions of this chapter. Earlier versions of this chapter were presented at the meeting of the American Society of Criminology in 1996 and the meeting of the Behavior Genetics Association in 1997, and a more extensive version of the initial meta-analysis portion was published in the *Psychological Bulletin*.

#### REFERENCES

Accili, D., Fishburn, C. S., Drago, J., Steiner, H., Lachowicz, J. E., Park, B. H., et al. (1996). A targeted mutation of the D3 dopamine receptor gene is associated with hyperactivity in mice. Proceedings of the National Academy of Sciences of the USA, 93, 1945–1949.

- Achenbach, T. M., & Edelbrock, C. S. (1983). Manual for the Child Behavior Checklist and Revised Child Behavior Profile. Burlington: University of Vermont.
- Andershed, H., Kerr, M., Stattin, H., & Levander, S. (2002). Psychopathic traits in non-referred youths: A new assessment tool. In E. Blauuw & L. Sheridan (Eds.), Psychopaths: Current international perspectives (pp. 131–158). The Hague: Elsevier.
- Anney, R. J., Lasky-Su, J., O'Dúshláine, C., Kenny, E., Neale, B. M., Mulligan, A., et al. (2008). Conduct disorder and ADHD: Evaluation of conduct problems as a categorical and quantitative trait in the international multicentre ADHD genetics study. American Journal of Medical Genetics B: Neuropsychiatric Genetics, 147(8), 1369–1378.
- Baca-Garcia, E., Vaquero, C., Diaz-Sastre, C., García-Resa, E., Saiz-Ruiz, J., Fernández-Piqueras, J., et al. (2004). Lack of association between the serotonin transporter promoter gene polymorphism and impulsivity or aggressive behavior among suicide attempters and healthy volunteers. *Psychiatry Research*, 126(2), 99–106.
- Bachner-Melman, R., Zohar, A. H., Bacon-Shnoor, N., Elizur, Y., Nemanov, L., Gritsenko, I., et al. (2005). Link between vasopressin receptor AVPR1A promoter region microsatellites and measures of social behavior in humans. *Journal of Individual Differences*, 26(1), 2–10.
- Beaver, K. M., Wright, J. P., DeLisi, M., Walsh, A., Vaughn, M. G., Boisvert, D., et al. (2007). A gene × gene interaction between DRD2 and DRD4 is associated with conduct disorder and antisocial behavior in males. *Behavioral and Brain Functions*, 3, 30.
- Beitchman, J., Baldassarra, L., Mik, H., De Luca, V., King, N., Bender, D., et al. (2006). Serotonin transporter polymorphisms and persistent, pervasive childhood aggression. *American Journal of Psychiatry*, 163(6), 1103–1105.
- Beitchman, J. H., Zai, C. C., Muir, K., Berall, L., Nowrouzi, B., Choi, E., et al. (2012). Childhood aggression, callous–unemotional traits and oxytocin genes. *European Child and Adolescent Psychiatry*, 21(3), 125–132.
- Benning, S. D., Patrick, C. J., Blonigen, D. M., Hicks, B. M., & Iacono, W. G. (2005). Estimating facets of psychopathy from normal personality traits: A step toward community-epidemiological investigations. Assessment, 12, 3–18
- Berman, M. E., Kavoussi, R. J., & Coccaro, E. F. (1997). Neurotransmitter correlates of human aggression. In D. M. Stoff, J. Breiling, & J. D. Maser (Eds.), *Handbook of antisocial behavior* (pp. 305–313). New York: Wiley.
- Bester-Meredith, J. K., & Marler, C. A. (2001). Vasopressin and aggression in cross-fostered California mice (*Peromyscus californicus*) and white-footed mice (*Peromyscus leucopus*). Hormones and Behavior, 40(1), 51–64.

- Bezdjian, S., Raine, A., Baker, L. A., & Lynam, D. R. (2011). Psychopathic personality in children: Genetic and environmental contributions. *Psychological Medicine*, 41(3), 589–600.
- Blair, R. J. R. (2006). The emergence of psychopathy: Implications for the neuropsychological approach to developmental disorders. Cognition, 101(2), 414–442.
- Blonigen, D. M., Carlson, S. R., Krueger, R. F., & Patrick, C. J. (2003). A twin study of self-reported psychopathic personality traits. *Personality and Individu*al Differences, 35, 179–197.
- Burt, S. A. (2009). Are there meaningful etiological differences within antisocial behavior?: Results of a meta-analysis. *Clinical Psychology Review*, 29, 163–178.
- Burt, S. A., & Mikolajewski, A. J. (2008). Preliminary evidence that specific candidate genes are associated with adolescent-onset antisocial behavior. Aggressive Behavior, 34(4), 437–445.
- Cadoret, R. J., Langbehn, D., Caspers, K., Troughton, E. P., Yucuis, R., Sandhu, H. K., et al. (2003). Associations of the serotonin transporter promoter polymorphism with aggressivity, attention deficit, and conduct disorder in an adoptee population. Comprehensive Psychiatry, 44(2), 88–101.
- Cases, O., Seif, I., Grimsby, J., Gaspar, P., Chen, K., Pournin, S., et al. (1995). Aggressive behavior and altered amounts of brain serotonin and norepinephrine in mice lacking MAOA. Science, 268, 1763–1766.
- Caspi, A., Langley, K., Milne, B., Moffitt, T. E., O'Donovan, M., Owen, M. J., et al. (2008). A replicated molecular genetic basis for subtyping antisocial behavior in children with attention-deficit/hyperactivity disorder. Archives of General Psychiatry, 65(2), 203–210.
- Caspi, A., McClay, J., Moffitt, T. E., Mill, J., Martin, J., Craig, I. W., et al. (2002). Role of genotype in the cycle of violence in maltreated children. *Science*, 297, 851–854.
- Castellanos, F. X., & Tannock, R. (2002). Neuroscience of attention-deficit/hyperactivity disorder: The search for endophenotypes. *Nature Reviews Neurosci*ence, 3(8), 617–628.
- Coccaro, E. F., Kavoussi, R. J., Hauger, R. L., Cooper, T. B., & Ferris, C. F. (1998). Cerebrospinal fluid vasopressin levels: Correlates with aggression and serotonin function in personality-disordered subjects. *Archives of General Psychiatry*, 55(8), 708–714.
- Cooke, D. J., & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment*, 13, 171–188.
- Cooney, N. L., Kadden, R. M., & Litt, M. D. (1990). A comparison of methods for assessing sociopathy in male and female alcoholics. *Journal of Studies on Alcohol*, 51(1), 42–48.
- Dadds, M. R., El Masry, Y., Wimalaweera, S., & Guastella, A. J. (2008). Reduced eye gaze explains "fear blindness" in childhood psychopathic traits. *Journal* of the American Academy of Child and Adolescent Psychiatry 47, 455–463.
- Dadds, M. R., Perry, Y., Hawes, D. J., Merz, S., Riddell,

A. C., Haines, D. J., et al. (2006). Attention to the eyes and fear-recognition deficits in child psychopathy. *British Journal of Psychiatry*, 189(3), 280–281.

- Davidge, K. M., Atkinson, L., Douglas, L., Lee, V., Shapiro, S., Kennedy, J. L., et al. (2004). Association of the serotonin transporter and 5HT1D [beta] receptor genes with extreme, persistent and pervasive aggressive behaviour in children. *Psychiatric Genetics*, 14(3), 143–146.
- DeVries, A. C., Young, W. S., III, & Nelson, R. J. (1997). Reduced aggressive behaviour in mice with targeted disruption of the oxytocin gene. *Journal of Neuroendocrinology*, 9(5), 363–368.
- DeYoung, C. G., Getchell, M., Koposov, R. A., Yrigollen, C. M., Haeffel, G. J., af Klinteberg, B., et al. (2010). Variation in the catechol-O-methyltransferase Val 158 Met polymorphism associated with conduct disorder and ADHD symptoms, among adolescent male delinquents. *Psychiatric Genetics*, 20(1), 20–24.
- Dick, D. M., Aliev, F., Krueger, R. F., Edwards, A., Agrawal, A., Lynskey, M., et al. (2011). Genome-wide association study of conduct disorder symptomatology. *Molecular Psychiatry*, 16(8), 800–808.
- Dick, D. M., Aliev, F., Wang, J. C., Grucza, R. A., Schuckit, M., Kuperman, S., et al. (2008). Using dimensional models of externalizing psychopathology to aid in gene identification. Archives of General Psychiatry, 65(3), 310–318.
- Dick, D. M., Li, T. K., Edenberg, H. J., Hesselbrock, V., Kramer, J., Kuperman, S., et al. (2004). A genomewide screen for genes influencing conduct disorder. *Molecular Psychiatry*, 9(1), 81–86.
- Doyle, A. E., Willcutt, E. G., Seidman, L. J., Biederman, J., Chouinard, V., Silva, J., et al. (2005). Attentiondeficit/hyperactivity disorder endophenotypes. *Biological Psychiatry*, 57(11), 1324–1335.
- Dulawa, S. C., Grandy, D. K., Low, M. J., Paulus, M. P., & Geyer, M. A. (1999). Dopamine D4 receptorknock-out mice exhibit reduced exploration of novel stimuli. *Journal of Neuroscience*, 19(21), 9550–9556.
- Ehlers, C. L., Gilder, D. A., Slutske, W. S., Lind, P. A., & Wilhelmsen, K. C. (2008). Externalizing disorders in American Indians: Comorbidity and a genome wide linkage analysis. American Journal of Medical Genetics B: Neuropsychiatric Genetics, 147(6), 690–698.
- Eisenberger, N. I., Way, B. M., Taylor, S. E., Welch, W. T., & Lieberman, M. D. (2007). Understanding genetic risk for aggression: Clues from the brain's response to social exclusion. *Biological Psychiatry*, 61(9), 1100–1108.
- Eley, T. C., Lichtenstein, P., & Stevenson, J. (1999). Sex differences in the etiology of aggressive and nonaggressive antisocial behavior: Results from two twin studies. *Child Development*, 70(1), 155–168.
- Ferris, C. F., Lu, S. F., Messenger, T., Guillon, C. D., Heindel, N., Miller, M., et al. (2006). Orally active vasopressin V1a receptor antagonist, SRX251, selectively blocks aggressive behavior. *Pharmacology Biochemistry and Behavior*, 83(2), 169–174.
- Ferris, C. F., Melloni, R. H., Jr., Koppel, G., Perry, K.

W., Fuller, R. W., & Delville, Y. (1997). Vasopressin/ serotonin interactions in the anterior hypothalamus control aggressive behavior in golden hamsters. *Journal of Neuroscience*, 17(11), 4331–4340.

- Ficks, C. A., Dong, L., & Waldman, I. D. (2014). Sex differences in the etiology of psychopathic traits in youth. *Journal of Abnormal Psychology*, 123(2), 406– 411.
- Ficks, C. A., & Waldman, I. D. (2014). Candidate genes for aggression and antisocial behavior: A metaanalysis of association studies of the 5HTTLPR and MAOA-uVNTR. *Behavior Genetics*, 44(5), 427–444.
- Foley, D. L., Eaves, L. J., Wormley, B., Silberg, J. L., Maes, H. H., Kuhn, J., et al. (2004). Childhood adversity, monoamine oxidase A genotype, and risk for conduct disorder. Archives of General Psychiatry, 61(7), 738–744.
- Fontaine, N. M., Rijsdijk, F. V., McCrory, E. J., & Viding, E. (2010). Etiology of different developmental trajectories of callous–unemotional traits. *Journal of* the American Academy of Child and Adolescent Psychiatry, 49(7), 656–664.
- Forsman, M., Lichtenstein, P., Andershed, H., & Larsson, H. (2008). Genetic effects explain the stability of psychopathic personality from mid- to late adolescence. *Journal of Abnormal Psychology*, 117(3), 606–617.
- Forsman, M., Lichtenstein, P., Andershed, H., & Larsson, H. (2010). A longitudinal twin study of the direction of effects between psychopathic personality and antisocial behaviour. *Journal of Child Psychology and Psychiatry*, 51(1), 39–47.
- Forth, A. E., Kosson, D. S., & Hare, R. D. (2003). Hare Psychopathy Checklist: Youth Version. Toronto: Multi-Health Systems.
- Fowler, T., Langley, K., Rice, F., van den Bree, M. B., Ross, K., Wilkinson, L. S., et al. (2009). Psychopathy trait scores in adolescents with childhood ADHD: The contribution of genotypes affecting MAOA, 5HTT and COMT activity. *Psychiatric Genetics*, 19(6), 312–319.
- Frick, P. J., & Hare, R. D. (2001). Antisocial process screening device. Toronto: Multi-Health Systems.
- Giros, B., Jaber, M., Jones, S. R., Wightman, R. M., & Caron, M. G. (1996). Hyperlocomotion and indifference to cocaine and amphetamine in mice lacking the dopamine transporter. *Nature*, 379, 606–612.
- Gizer, I. R., Ficks, C., & Waldman, I. D. (2009). Candidate gene studies of ADHD: A meta-analytic review. *Human Genetics*, 126(1), 51–90.
- Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A research note. *Journal of Child Psy*chology and Psychiatry, 38(5), 581–586.
- Gottesman, I. I., & Gould, T. D. (2003). The endophenotype concept in psychiatry: Etymology and strategic intentions. *American Journal of Psychiatry*, 160(4), 636–645.
- Gottesman, I. I., & Shields, J. (1972). Schizophrenia and genetics: A twin study vantage point. New York: Academic Press.

- Guo, G., Roettger, M. E., & Shih, J. C. (2007). Contributions of the DAT1 and DRD2 genes to serious and violent delinquency among adolescents and young adults. *Human Genetics*, 121(1), 125–136.
- Ha, T. M., Cho, D. M., Park, S. W., Joo, M. J., Lee, B. J., Kong, B. G., et al. (2005). Evaluating associations between 5-HTTLPR polymorphism and Alzheimer's disease for Korean patients. *Dementia and Geriatric Cognitive Disorders*, 20(1), 31–34.
- Haberstick, B. C., Lessem, J. M., Hopfer, C. J., Smolen, A., Ehringer, M. A., Timberlake, D., et al. (2005). Monoamine oxidase A (MAOA) and antisocial behaviors in the presence of childhood and adolescent maltreatment. American Journal of Medical Genetics B: Neuropsychiatric Genetics, 135(1), 59–64.
- Haines, J. L. (1998). Genomic screening. In J. L. Haines & M. A. Pericak-Vance (Eds.), Approaches to gene mapping in complex human diseases (pp. 243–252). New York: Wiley.
- Hare, R. D., Hart, S. D., & Harpur, T. J. (1991). Psychopathy and the DSM-IV criteria for antisocial personality disorder. *Journal of Abnormal Psychology*, 100(3), 391–398.
- Hennig, J., Reuter, M., Netter, P., Burk, C., & Landt, O. (2005). Two types of aggression are differentially related to serotonergic activity and the A779C TPH polymorphism. *Behavioral Neuroscience*, 119, 16–25.
- Holmes, A., Murphy, D. L., & Crawley, J. N. (2003). Abnormal behavioral phenotypes of serotonin transporter knockout mice: Parallels with human anxiety and depression. *Biological Psychiatry*, 54(10), 953–959.
- Holmes, J., Payton, A., Barrett, J., Harrington, R., Mc-Guffin, P., Owen, M., et al. (2002). Association of DRD4 in children with ADHD and comorbid conduct problems. American Journal of Medical Genetics, 114(2), 150–153.
- Huang, Y. Y., Cate, S. P., Battistuzzi, C., Oquendo, M. A., Brent, D., & Mann, J. J. (2004). An association between a functional polymorphism in the monoamine oxidase a gene promoter, impulsive traits and early abuse experiences. *Neuropsychopharmacology*, 29(8), 1498–1505.
- Huizinga, D., Haberstick, B. C., Smolen, A., Menard, S., Young, S. E., Corley, R. P., et al. (2006). Childhood maltreatment, subsequent antisocial behavior, and the role of monoamine oxidase A genotype. *Biological Psychiatry*, 60(7), 677–683.
- Johansson, A., Bergman, H., Corander, J., Waldman, I. D., Karrani, N., Salo, B., et al. (2012). Alcohol and aggressive behavior in men—moderating effects of oxytocin receptor gene (OXTR) polymorphisms. *Genes, Brain and Behavior*, 11(2), 214–221.
- Johansson, A., Westberg, L., Sandnabba, K., Jern, P., Salo, B., & Santtila, P. (2012). Associations between oxytocin receptor gene (OXTR) polymorphisms and self-reported aggressive behavior and anger: Interactions with alcohol consumption. *Psychoneuroendocri*nology, 37(9), 1546–1556.
- Jorm, A. F., Prior, M., Sanson, A., Smart, D., Zhang, Y., & Easteal, S. (2001). Association of a polymorphism

of the dopamine transporter gene with externalizing behavior problems and associated temperament traits: A longitudinal study from infancy to the midteens. American Journal of Medical Genetics, 105(4), 346–350.

- Kendler, K. S., Aggen, S. H., & Patrick, C. J. (2012). A multivariate twin study of the DSM-IV criteria for antisocial personality disorder. *Biological Psychiatry*, 71(3), 247–253.
- Kendler, K. S., Aggen, S. H., & Patrick, C. J. (2013). Familial influences on conduct disorder reflect 2 genetic factors and 1 shared environmental factor. JAMA Psychiatry, 70(1), 78–86.
- Kendler, K. S., Kuo, P. H., Todd Webb, B., Kalsi, G., Neale, M. C., Sullivan, P. F., et al. (2006). A joint genomewide linkage analysis of symptoms of alcohol dependence and conduct disorder. *Alcoholism: Clinical and Experimental Research*, 30(12), 1972–1977.
- Kim-Cohen, J., Caspi, A., Taylor, A., Williams, B., Newcombe, R., Craig, I. W., et al. (2006). MAOA, maltreatment, and gene–environment interaction predicting children's mental health: New evidence and a meta-analysis. *Molecular Psychiatry*, 11(10), 903–913.
- Koh, K. B., Kim, C. H., Choi, E. H., Lee, Y. J., & Seo, W. Y. (2012). Effect of tryptophan hydroxylase gene polymorphism on aggression in major depressive disorder and undifferentiated somatoform disorder. *Journal of Clinical Psychiatry*, 73(5), e574–e579.
- Kruesi, M. J., Rapoport, J. L., Hamburger, S., Hibbs, E., Potter, W. Z., Lenane, M., et al. (1990). Cerebrospinal fluid monoamine metabolites, aggression, and impulsivity in disruptive behavior disorders of children and adolescents. Archives of General Psychiatry, 47(5), 419–426.
- Kweon, Y. S., Lee, H. K., Lee, C. T., Lee, K. U., & Pae, C. U. (2005). Association of the serotonin transporter gene polymorphism with Korean male alcoholics. *Journal of Psychiatric Research*, 39(4), 371–376.
- Lahey, B. B., Rathouz, P. J., Lee, S. S., Chronis-Tuscano, A., Pelham, W. E., Waldman, I. D., et al. (2011). Interactions between early parenting and a polymorphism of the child's dopamine transporter gene in predicting future child conduct disorder symptoms. *Journal of Abnormal Psychology*, 120(1), 33–45.
- Lahey, B. B., & Waldman, I. D. (2003). A developmental propensity model of the origins of conduct problems during childhood and adolescence. In B. B. Lahey, T. E. Moffitt, & A. Caspi (Eds.), Causes of conduct disorder and juvenile delinquency (pp. 76–117). New York: Guilford Press.
- Larsson, H., Andershed, H., & Lichtenstein, P. (2006). A genetic factor explains most of the variation in the psychopathic personality. *Journal of Abnormal Psychology*, 115(2), 221–230.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment*, 66(3), 488–524.

- Lilienfeld, S. O., & Waldman, I. D. (1990). The relation between childhood attention-deficit hyperactivity disorder and adult antisocial behavior reexamined: The problem of heterogeneity. *Clinical Psychology Review*, 10, 699–725.
- Loehlin, J. C. (1992). Latent variable models: An introduction to factor, path, and structural analysis (2nd ed.). Hillsdale, NJ: Erlbaum.
- LoParo, D., Johansson, A., Walum, H., Westberg, L., Santtila, P., & Waldman, I. D. (2016). Rigorous tests of gene–environment interactions in a lab study of the oxytocin receptor gene (OXTR) and aggression. American Journal of Medical Genetics, 171(5), 589–602.
- Lu, R. B., Lee, J. F., Huang, S. Y., Lee, S. Y., Chang, Y. H., Kuo, P. H., et al. (2012). Interaction between ALDH2\*1\*1 and DRD2/ANKK1 TaqI A1A1 genes may be associated with antisocial personality disorder not co-morbid with alcoholism. Addiction Biology, 17(5), 865–874.
- Lykken, D. T. (1957). A study of anxiety in the sociopathic personality. *Journal of Abnormal and Social Psychology*, 55(1), 6–10.
- Lynam, D. R. (1997). Pursuing the psychopath: Capturing the fledgling psychopath in a nomological net. *Journal of Abnormal Psychology*, 106(3), 425–438.
- Lynam, D. R. (2002). Fledgling psychopathy: A view from personality theory. Law and Human Behavior, 26(2), 255–259.
- Malik, A. I., Zai, C. C., Abu, Z., Nowrouzi, B., & Beitchman, J. H. (2012). The role of oxytocin and oxytocin receptor gene variants in childhood-onset aggression. Genes, Brain and Behavior, 11(5), 545–551.
- Manolio, T. A., Collins, F. S., Cox, N. J., Goldstein, D. B., Hindorff, L. A., Hunter, D. J., et al. (2009). Finding the missing heritability of complex diseases. *Nature*, 461, 747–753.
- Manuck, S. B., Flory, J. D., Ferrell, R. E., Mann, J. J., & Muldoon, M. F. (2000). A regulatory polymorphism of the monoamine oxidase-A gene may be associated with variability in aggression, impulsivity, and central nervous system serotonergic responsivity. *Psychiatry Research*, 95(1), 9–23.
- McGue, M., Zhang, Y., Miller, M. B., Basu, S., Vrieze, S., Hicks, B., et al. (2013). A genome-wide association study of behavioral disinhibition. *Behavior Genetics*, 43(5), 363–373.
- Morgan, A. B., & Lilienfeld, S. O. (2000). A meta-analytic review of the relation between antisocial behavior and neuropsychological measures of executive function. Clinical Psychology Review, 20, 113–156.
- Neale, B. M., & Sham, P. C. (2004). The future of association studies: Gene-based analysis and replication. *American Journal of Human Genetics*, 75(3), 353–362.
- Neale, M. C. (1995). Mx: Statistical modeling. Richmond: Department of Psychiatry, Medical College of Virginia, Virginia Commonwealth University.
- New, A. S., Gelernter, J., Goodman, M., Mitropoulou, V., Koenigsberg, H., Silverman, J., et al. (2001). Sui-

cide, impulsive aggression, and HTR1B genotype. *Biological Psychiatry*, 50(1), 62–65.

- Nilsson, K. W., Sjöberg, R. L., Damberg, M., Leppert, J., Öhrvik, J., Alm, P. O., et al. (2006). Role of monoamine oxidase A genotype and psychosocial factors in male adolescent criminal activity. *Biological Psychiatry*, 59(2), 121–127.
- Patrick, C. J. (1994). Emotion and psychopathy: Startling new insights. Psychophysiology, 31(4), 319–330.
- Patrick, C. J., & Drislane, L. E. (2015). Triarchic model of psychopathy: Origins, operationalizations, and observed linkages with personality and general psychopathology. *Journal of Personality*, 83(6), 627–643.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, 21(3), 913–938.
- Ponce, G., Hoenicka, J., Jimenez-Arriero, M. A., Rodriguez-Jimenez, R., Aragues, M., Martin-Sune, N., et al. (2008). DRD2 and ANKK1 genotype in alcoholdependent patients with psychopathic traits: Association and interaction study. *British Journal of Psychiatry*, 193(2), 121–125.
- Prichard, Z. M., Jorm, A. F., Mackinnon, A., & Easteal, S. (2007). Association analysis of 15 polymorphisms within 10 candidate genes for antisocial behavioural traits. *Psychiatric Genetics*, 17(5), 299–303.
- Reese, J., Kraschewski, A., Anghelescu, I., Winterer, G., Schmidt, L. G., Gallinat, J., et al. (2010). Haplotypes of dopamine and serotonin transporter genes are associated with antisocial personality disorder in alcoholics. *Psychiatric Genetics*, 20(4), 140–152.
- Retz, W., Retz-Junginger, P., Supprian, T., Thome, J., & Rösler, M. (2004). Association of serotonin transporter promoter gene polymorphism with violence: Relation with personality disorders, impulsivity, and childhood ADHD psychopathology. *Behavioral Sciences and the Law*, 22(3), 415–425.
- Rhee, S. H., & Waldman, I. D. (2002). Genetic and environmental influences on antisocial behavior: A meta-analysis of twin and adoption studies. *Psychological Bulletin*, 128(3), 490–529.
- Ripke, S., O'Dushlaine, C., Chambert, K., Moran, J. L., Kähler, A. K., Akterin, S., et al. (2013). Genomewide association analysis identifies 13 new risk loci for schizophrenia. *Nature Genetics*, 45(10), 1150– 1159.
- Rubinstein, M., Phillips, T. J., Bunzow, J. R., Falzone, T. L., Dziewczapolski, G., Zhang, G., et al. (1997). Mice lacking dopamine D4 receptors are supersensitive to ethanol, cocaine, and methamphetamine. *Cell*, 90(6), 991–1001.
- Sadeh, N., Javdani, S., Jackson, J. J., Reynolds, E. K., Potenza, M. N., Gelernter, J., et al. (2010). Serotonin transporter gene associations with psychopathic traits in youth vary as a function of socioeconomic resources. *Journal of Abnormal Psychology*, 119(3), 604–609.

- Saudou, F., Amara, D. A., Dierich, A., LeMeur, M., Ramboz, S., Segu, L., et al. (1994). Enhanced aggressive behavior in mice lacking 5-HTβ1 receptor. Science, 265, 1875–1878.
- Schmidt, L. A., Fox, N. A., & Hamer, D. H. (2007). Evidence for a gene–gene interaction in predicting children's behavior problems: Association of serotonin transporter short and dopamine receptor D4 long genotypes with internalizing and externalizing behaviors in typically developing 7-year-olds. Development and Psychopathology, 19(4), 1105–1116.
- Seeman, P., & Madras, B. K. (1998). Anti-hyperactivity medication: Methylphenidate and amphetamine. *Molecular Psychiatry*, 3(5), 386–396.
- Solanto, M. V. (1984). Neuropharmacological basis of stimulant drug action in attention deficit disorder with hyperactivity: A review and synthesis. *Psychological Bulletin*, 95(3), 387–409.
- Solanto, M. V. (1998). Neuropsychopharmacological mechanisms of stimulant drug action in attentiondeficit hyperactivity disorder: A review and integration. *Behavioural Brain Research*, 94(1), 127–152.
- Stallings, M. C., Corley, R. P., Dennehey, B., Hewitt, J. K., Krauter, K. S., Lessem, J. M., et al. (2005). A genome-wide search for quantitative trait loci that influence antisocial drug dependence in adolescence. *Archives of General Psychiatry*, 62(9), 1042–1051.
- Staner, L., Uyanik, G., Correa, H., Tremeau, F., Monreal, J., Crocq, M. A., et al. (2002). A dimensional impulsive–aggressive phenotype is associated with the A218C polymorphism of the tryptophan hydroxylase gene: A pilot study in well-characterized impulsive inpatients. American Journal of Medical Genetics, 114(5), 553–557.
- Takahashi, A., Quadros, I. M., de Almeida, R. M. M., & Miczek, K. A. (2012). Behavioral and pharmacogenetics of aggressive behavior. Current Topics in Behavioral Neuroscience, 12, 73–138.
- Takayanagi, Y., Yoshida, M., Bielsky, I. F., Ross, H. E., Kawamata, M., Onaka, T., et al. (2005). Pervasive social deficits, but normal parturition, in oxytocin receptor-deficient mice. Proceedings of the National Academy of Sciences of the USA, 102(44), 16096– 16101.
- Taylor, J., Loney, B. R., Bobadilla, L., Iacono, W. G., & McGue, M. (2003). Genetic and environmental influences on psychopathy trait dimensions in a community sample of male twins. *Journal of Abnormal Child Psychology*, 31(6), 633–645.
- Taylor, J., McGue, M., Iacono, W. G., & Lykken, D. T. (2000). A behavioral genetic analysis of the relationship between the socialization scale and self-reported delinquency. *Journal of Personality*, 68(1), 29–50.
- Thapar, A., Langley, K., Fowler, T., Rice, F., Turic, D., Whittinger, N., et al. (2005). Catechol O-methyltransferase gene variant and birth weight predict early-onset antisocial behavior in children with attention-deficit/hyperactivity disorder. Archives of General Psychiatry, 62(11), 1275–1278.

- Thompson, R., Gupta, S., Miller, K., Mills, S., & Orr, S. (2004). The effects of vasopressin on human facial responses related to social communication. *Psychoneuroendocrinology*, 29(1), 35–48.
- Tielbeek, J. J., Medland, S. E., Benyamin, B., Byrne, E. M., Heath, A. C., Madden, P. A., et al. (2012). Unraveling the genetic etiology of adult antisocial behavior: A genome-wide association study. *PLOS ONE*, 7(10), e45086.
- Trzaskowski, M., Dale, P. S., & Plomin, R. (2013). No genetic influence for childhood behavior problems from DNA analysis. *Journal of the American Academy* of Child and Adolescent Psychiatry, 52(10), 1048–1056.
- Vaidyanathan, U., Malone, S. M., Donnelly, J. M., Hammer, M. A., Miller, M. B., McGue, M., et al. (2014). Heritability and molecular genetic basis of antisaccade eye tracking error rate: A genome-wide association study. *Psychophysiology*, 51(12), 1272–1284.
- Vaidyanathan, U., Malone, S. M., Miller, M. B., McGue, M., & Iacono, W. G. (2014). Heritability and molecular genetic basis of acoustic startle eye blink and affectively modulated startle response: A genome-wide association study. *Psychophysiology*, 51(12), 1285– 1299.
- Vassos, E., Collier, D. A., & Fazel, S. (2013). Systematic meta-analyses and field synopsis of genetic association studies of violence and aggression. *Molecular Psychiatry*, 19, 471–477.
- Vaughn, M. G., DeLisi, M., Beaver, K. M., & Wright, J. P. (2009). DAT1 and 5HTT are associated with pathological criminal behavior in a nationally representative sample of youth. *Criminal Justice and Behavior*, 36(11), 1113–1124.
- Viding, E., Blair, J. R., Moffitt, T. E., & Plomin, R. (2005). Evidence for substantial genetic risk for psychopathy in 7-year-olds. *Journal of Child Psychology* and Psychiatry, 46(6), 592–597.
- Viding, E., Hanscombe, K. B., Curtis, C. J., Davis, O. S., Meaburn, E. L., & Plomin, R. (2010). In search of genes associated with risk for psychopathic tendencies in children: A two-stage genome-wide association study of pooled DNA. *Journal of Child Psychology* and Psychiatry, 51(7), 780–788.
- Viding, E., Price, T. S., Jaffee, S. R., Trzaskowski, M., Davis, O. S., Meaburn, E. L., et al. (2013). Genetics of callous–unemotional behavior in children. PLOS ONE, 8(7), e65789.
- Visscher, P. M., Brown, M. A., McCarthy, M. I., & Yang, J. (2012). Five years of GWAS discovery. American Journal of Human Genetics, 90(1), 7–24.
- Vrieze, S. I., Feng, S., Miller, M. B., Hicks, B. M., Pankratz, N., Abecasis, G. R., et al. (2014). Rare nonsynonymous exonic variants in addiction and behavioral disinhibition. *Biological Psychiatry*, 75(10), 783–789.
- Vrieze, S. I., Malone, S. M., Pankratz, N., Vaidyanathan, U., Miller, M. B., Kang, H. M., et al. (2014). Genetic

associations of nonsynonymous exonic variants with psychophysiological endophenotypes. *Psychophysiology*, *51*(12), 1300–1308.

- Vrieze, S. I., McGue, M., Miller, M. B., Hicks, B. M., & Iacono, W. G. (2013). Three mutually informative ways to understand the genetic relationships among behavioral disinhibition, alcohol use, drug use, nicotine use/dependence, and their co-occurrence: Twin biometry, GCTA, and genome-wide scoring. Behavior Genetics, 43(2), 97–107.
- Waldman, I. D. (1996). Aggressive children's hostile perceptual and response biases: The role of attention and impulsivity. *Child Development*, 67(3), 1015–1033.
- Waldman, I. D. (2005). Statistical approaches to complex phenotypes: Evaluating neuropsychological endophenotypes for attention-deficit/hyperactivity disorder. *Biological Psychiatry*, 57(11), 1347–1356.
- Waldman, I. D., & Gizer, I. (2006). The genetics of attention deficit hyperactivity disorder. *Clinical Psychology Review*, 26(4), 396–432.
- Waldman, I. D., Tackett, J. L., Van Hulle, C. A., Applegate, B., Pardini, D., Frick, P. J., et al. (2011). Child and adolescent conduct disorder substantially shares genetic influences with three socioemotional dispositions. *Journal of Abnormal Psychology*, 120(1), 57–70.
- Wersinger, S. R., Ginns, E. I., O'Carroll, A. M., Lolait, S. J., & Young, W. S. (2002). Vasopressin V1b receptor knockout reduces aggressive behavior in male mice. *Molecular Psychiatry*, 7(9), 975–984.
- Wu, T., & Barnes, J. C. (2013). Two dopamine receptor genes (DRD2 and DRD4) predict psychopathic personality traits in a sample of American adults. *Journal of Criminal Justice*, 41, 188–195.
- Yang, J., Lee, S. H., Goddard, M. E., & Visscher, P. M. (2011). GCTA: A tool for genome-wide complex trait analysis. American Journal of Human Genetics, 88(1), 76–82.
- Yang, M., Kavi, V., Wang, W., Wu, Z., & Hao, W. (2012). The association of 5-HTR2A-1438A/G, COMTVal-158Met, MAOA-LPR, DATVNTR and 5-HTTVN-TR gene polymorphisms and antisocial personality disorder in male heroin-dependent Chinese subjects. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, 36, 282–289.
- Young, S. E., Smolen, A., Corley, R. P., Krauter, K. S., DeFries, J. C., Crowley, T. J., et al. (2002). Dopamine transporter polymorphism associated with externalizing behavior problems in children. *American Journal of Medical Genetics*, 114(2), 144–149.
- Young, S., Smolen, A., Hewitt, J., Haberstick, B., Stallings, M., Corley, R., et al. (2006). Interaction between MAO-A genotype and maltreatment in the risk for conduct disorder: Failure to confirm in adolescent patients. *American Journal of Psychiatry*, 163(6), 1019–1025.

aggressive or		twin(s) or
aggression or		adoptee(s) or
antisocial or		adoptive or
conduct or		genetic or
psychopathy or		genetics or
sociopathy or		genes or
crime or		environmental or
criminal or	and	environment
criminality or		
delinquent or		
delinquency or		
behavior problem(s) or		
problem behavior(s)		

# APPENDIX 14.1. Terms used in PsycINFO and Medline Searches

APPENDIX 14.2. Correlations for Adoption and Twin Relationships

Relationship	Correlation
Adoption studies	
Adoptee–adoptive parent	1*C
Adoptee-biological parent	.5*A
Biological child–biological parent	.5*A + 1*C
Adoptive siblings	1*C
Biological siblings	.5*A + 1*C + .25*D
Twin studies	
MZ twin pairs reared together	1*A + 1*C + 1*D
DZ twin pairs reared together	.5*A + 1*C + .25*D
MZ twin pairs reared apart	1*A + 1*D
DZ twin pairs reared apart	.5*A + .25*D

# CHAPTER 15

# Family Background and Psychopathy

# DAVID P. FARRINGTON HENRIETTE BERGSTRØM

sychopathy, at least as operationally defined by the Psychopathy Checklist (PCL) family of measures, is not a unitary construct. It includes explanatory elements such as low empathy, impulsiveness, and a cold, callous, and conning personality, as well as behavioral elements such as antisocial and criminal conduct. In order to investigate the causal links between personality and behavior, it has been suggested that psychopathy should be operationally defined only by the personality elements of an arrogant and deceitful interpersonal style (Facet 1), deficient affective experience (Facet 2), and an impulsive and irresponsible lifestyle (Facet 3) (Cooke, Michie, Hart, & Clark, 2004; Skeem & Cooke, 2010a, 2010b). However, Hare and Neumann (2010) argued that antisocial behavior (Facet 4) should be included in the construct.

Because most research on family background has focused on the general diagnosis of psychopathy, we concentrate in this chapter on adult psychopathy as operationally defined by total scores on PCL measures. However, we refer to these as psychopathic symptom scores, since most of the relevant research is not on clinically diagnosed psychopaths. Psychopathy as assessed by the PCL-R includes affective/interpersonal features (Factor 1, encompassing Facets 1 and 2) and irresponsible/ antisocial features (Factor 2, encompassing Facets 3 and 4) (see Hare, Neumann, & Mokros, Chapter 3, this volume). We do not focus on subtypes of highly psychopathic individuals, such as primary versus secondary (Hicks & Drislane, Chapter 13, this volume).

Few researchers on adult psychopathy have tried to investigate family factors that might predict, influence, or cause psychopathy. In contrast, researchers who are interested in adolescent psychopathic symptoms have been more concerned with family factors (see Campbell, Porter, & Santor, 2004; Forth & Burke, 1998). The neglect of family factors in adult studies is surprising in light of the pioneering research by William and Joan McCord (1964), who argued that parental rejection, an antisocial parent, erratic discipline, and poor parental supervision all influenced the development of psychopathy. Similarly, despite the seminal work of Robins (1966, 1979), "we have relatively few studies that have measured the effects of these [child and family] risks, prospectively measured, on adult personality disorder symptoms" (Cohen, 1996, p. 126). Accordingly, there have been few reviews of research on family factors contributing to psychopathy (e.g., Farrington, Ullrich, & Salekin, 2010; McCord, 2001).

Our main purpose in this chapter is to review what is known about family background factors as predictors of psychopathic symptoms. The focus is on predictive risk factors (Murray, Farrington, & Eisner, 2009) comprising family-related variables that predict a high score on psychopathy measures, or that strengthen the relationship between earlier and later psychopathic tendencies (Lynam, Loeber, & Stouthamer-Loeber, 2008). Variables of the latter type are considered because of the increased interest in the role of family and social factors in the stability or escalation of psychopathic symptoms over time (Andershed, 2010; Lynam et al., 2008). Where possible, family factors that might reduce the risk of developing psychopathic symptoms are also discussed. "Protective factors" refer to either direct predictors of low psychopathy, variables that predict low psychopathy in a risk group, or variables that weaken the relationship between psychopathic symptoms at two consecutive time points (Farrington & Ttofi, 2012; Lösel & Farrington, 2012; Lynam et al., 2008). However, there is a lack of research on such factors and, as a result, more research is needed to discover protective factors that might decrease the likelihood of psychopathy in individuals who are at risk.

The best method of establishing that a family factor predicts later psychopathic tendencies is to carry out a prospective longitudinal survey, and the emphasis in this chapter is on results obtained in such surveys (for descriptions of these surveys, see Farrington, 2015; Kalb, Farrington, & Loeber, 2001; Loeber & Farrington, 1997). They avoid retrospective bias (e.g., where the recollections of parents about their childrearing methods are biased by the knowledge that their child has developed psychopathic symptoms) and help in establishing causal order. Also, high-psychopathy individuals emerge naturally from an initially nonpsychopathic population in community surveys, therefore allowing us to avoid the problem of how to choose a control group of nonpsychopathic individuals. If extreme groups (e.g., high-psychopathy offenders vs. well-behaved nonoffenders) are compared, this will lead to an overestimate of the strength of relationships between explanatory variables and psychopathy. Retrospective case-control studies of high-psychopathy offenders (cases) and nonpsychopathic offenders (controls) are also problematic because it is not clear that they will shed much light on the development of psychopathy in the general population. In investigating the causes of psychopathy, prospective probabilities (e.g., the proportion of poorly supervised children who develop psychopathic symptoms) are more relevant than retrospective probabilities (e.g., the proportion of psychopaths who were poorly supervised by their parents).

Unfortunately, there are very few prospective longitudinal surveys that specifically investigate the development of psychopathic symptoms in adults. The most important are the Cambridge Study in Delinquent Development (CSDD) and the Pittsburgh Youth Study (PYS), which are discussed later. Consequently, much of this chapter reviews knowledge gained from both cross-sectional and longitudinal surveys of criminal behavior, as well as psychopathic tendencies that are highly correlated with persistent, serious and violent offending. As Hart and Hare (1997, p. 22) pointed out:

Many psychopaths engage in chronic criminal conduct and do so at a high rate, whereas only a small minority of those who engage in criminal conduct are psychopaths. This means that psychopaths are responsible for a disproportionate amount of crime in our society.

On the other hand, it should be pointed out that the two widely accepted components of psychopathy (Factor 1, reflecting affective/interpersonal symptoms, and Factor 2, reflecting an irresponsible/antisocial lifestyle) (Hare, 2003) are differentially related to chronic offending and antisocial personality disorder. The affective/interpersonal component is much less strongly associated with criminal deviancy, particularly when researchers control for its overlap with the irresponsible/antisocial lifestyle component (Leistico, Salekin, De-Coster, & Rogers, 2008; Verona, Patrick, & Joiner, 2001).

The vast majority of persistent or chronic offenders score high on measures of antisocial personality; for example, in the CSDD, Farrington (2000) found that 93% of adult chronic offenders (with five or more convictions between ages 21 and 40) fell among the most antisocial quarter of men, in terms of features of antisocial personality disorder, at age 32. However, there are relatively few prospective longitudinal studies of family factors as predictors of persistent or chronic offending. Generally, chronic offenders are more extreme than nonchronic offenders in rates of early family risk factors (Farrington & West, 1993). As a consequence, studies of family factors as predictors of offending are likely to underestimate the strength of these factors as predictors of chronic offending or psychopathic symptoms in community samples.

One of the reasons for the scarcity of prospective longitudinal studies specifically focusing on psychopathic symptoms in community samples is the fact that the Psychopathy Checklist—Revised (PCL-R) (Hare, 2003) was largely designed to be used with male prisoners. However, the development of the Psychopathy Checklist: Screening Version (PCL:SV; Hart, Cox, & Hare, 1995) for use with community samples made longitudinal studies of psychopathy more feasible (Forth, Brown, Hart, & Hare, 1996). The PCL:SV takes less time to complete, its scores are highly correlated (r = .8) with PCL-R scores, and it indexes the same underlying constructs (Cooke, Michie, Hart, & Hare, 1999). There is still the problem of the low prevalence of clinically defined "psychopaths" in community samples, but changes in perceptions of the nature of psychopathy have helped to rectify this. Psychopathy was originally conceptualized as a categorical construct, but the current consensus is that psychopathic tendencies are distributed along a dimensional continuum (Guay, Ruscio, Knight, & Hare, 2007; Marcus, John, & Edens, 2004). This shift in understanding also has implications for establishing relationships between family factors and psychopathy. Researchers are no longer as concerned with studying factors that predict a clinical diagnosis using a PCL-R cutoff as with investigating the causes and development of individuals with high psychopathy scores.

#### The CSDD

This chapter presents results from the CSDD, a 48-year prospective longitudinal survey of the development of offending and antisocial behavior. In this survey, 411 London boys (G2) have been followed up from age 8 to age 56 (Farrington, 2003; Farrington et al., 2006; Farrington, Coid, & West, 2009; Farrington, Piquero, & Jennings, 2013). Various individual, family, and socioeconomic risk factors were measured at ages 8–10, before any of the boys could be convicted. At age 32, 378 of the 403 men who were still alive were interviewed (94%). At age 48, 365 of the 394 men who were still alive were interviewed (93%).

Of the 365 men who completed a social interview at age 48, 304 (83%) also completed a medical interview including the Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II; First, Gibbon, Spitzer, Williams, & Benjamin, 1997) and the PCL:SV. The SCID-II assesses avoidant, dependent, obsessive–compulsive, paranoid, schizoid, histrionic, narcissistic, borderline, and antisocial personality disorders. The 12-item PCL:SV was originally scored by a medical doctor who interviewed the men (Crystal Romilly), and it was rescored independently by a PhD-level psychologist (Simone Ullrich). Conviction records were taken into account in scoring the PCL:SV. The total scores for the two diagnostic raters correlated .95. The final scores ranged from 0 to 17 (out of a possible maximum of 24), with a mean of 3.5 and standard deviation of 3.8.

By age 56, 177 of 404 men deemed to be at risk (44%) had been convicted of one or more offenses, excluding seven men who emigrated permanently before age 21 and therefore could not be searched for convictions (see Farrington, Ttofi, Crago, & Coid, 2014). Of the men with recorded convictions, 31 were defined as chronic offenders because they had 10 or more convictions. These chronic offenders (7.7% of the sample) accounted for 53% of all convictions (i.e., 485 out of 909).

When PCL:SV scores were compared with numbers of convictions, it was clear that there were qualitative differences between those scoring 10 or more on the PCL:SV (11% of the sample) and the remainder of the study participants. As shown in Table 15.1, 97% of the 33 men scoring 10 or more, 66% of those scoring 6-9, and 57% of those scoring 3-5 were convicted, compared with only 20% of those scoring 0–2. Over half (52%) of the men scoring 10 or more were chronic offenders, compared with only 2% of the remainder. The vast majority of chronic offenders who completed the medical interview (17 out of 22) scored 10 or more on the PCL:SV. The average number of convictions and average number of antisocial personality disorder criteria fulfilled on the SCID-II were also high for those scoring 10 or more on the PCL:SV (see Table 15.1).

In light of these results, it was decided to investigate early risk factors for the 33 men who scored 10 or more on the PCL:SV (11%)-termed the "most psychopathic" males-versus the remaining 271. Of course, it must be acknowledged that even those males who scored the highest on psychopathic symptoms in this community sample would not necessarily be classified as clinical "psychopaths." According to the PCL:SV manual (Hart et al., 1995), a "high" score in a community sample is 16 or above. Only two men achieved this score in the assessment at age 48, suggesting that few of the men who were highest in psychopathic tendencies suffered from a severe personality disorder at this age. The number would probably have been greater at younger ages. Nevertheless, based on the distribution of PCL:SV scores within this sample, it is accurate to state that the 33 males who scored 10 or above on the PCL:SV were the most psychopathic at age 48. And importantly, there is no other longitudinal study that has examined childhood risk factors in relation to psychopathic symptoms assessed 40 years later.

PCL:SV score	No. of men	Mean ASPD	Mean convictions	% convicted	% chronic
0–2	162	0.21	0.29	20.5	0.0
3–5	74	1.05	1.68	56.8	2.7
6–9	35	2.14	3.83	65.7	8.6
10+	33	5.76	9.97	97.0	51.5

TABLE 15.1. Differences among PCL:SV Scores

*Note.* ASPD, number of antisocial personality disorder criteria fulfilled on the SCID-II; chronic, 10 or more convictions to age 56.

Between 2004 and 2013, efforts were made to interview the biological children of the original CSDD males. Only children at least 18 years of age (born up to 1995) were targeted (Farrington, Ttofi, Crago, & Coid, 2015). For purposes of reference, the original CSDD males are termed "generation 2" (G2), their biological parents are termed "generation 1" (G1), and their biological children are termed "generation 3" (G3). Of the 653 eligible G3 children, 551 (84.4%) were interviewed at the average age of 25-comprising 291 (84.8%) of the 343 G3 males and 260 (83.9%) of the 310 G3 females. Also, the G3 children were searched in criminal records at the median age of 30. Therefore, the CSDD permits a unique examination of earlier family factors associated with subsequent psychopathy in three generations: family factors in G1 (measured when the G2 boys were ages 8–10) as related to psychopathy in G2 (measured when the G2 men were age 48), and family factors in G2 (mostly measured when the G2 men were age 32) as related to psychopathy in G3 (measured at the average age of 25). The G3 interviews were conducted by Katherine Auty, Louise Harnett, and Richard Turner, and they were trained in PCL:SV administration by Stephen Hart and Simone Ullrich.

As with the G2 males, the proportion of G3 males who were convicted (up to age 32) increased with the PCL:SV score: Convictions were found for 9.3% of 107 who scored 0–2, 21.3% of 75 who scored 3–5, 45.3% of 53 who scored 6–9, and 72.2% of 36 who scored 10 or more. Similar results were obtained with the G3 females, although their PCL:SV scores were lower on average (M = 2.3 compared to 4.5 for the G3 males) and their overall conviction rate was also lower (9.1% compared with 28.0% for G3 males). The conviction rates for G3 females by PCL:SV score category were 3.7% of 172 who scored 0–2, 16.0% of 50 who scored 3–5, and 28.1% of 32 who scored 6 or more. The 36 G3 males who scored 10 or more, and the

32 G3 females who scored 6 or more, were identified as relatively high psychopathy scorers in the analyses reported below.

### **Family Factors**

Reviews of the literature confirm the importance of family factors as predictors of offending. Smith and Stern (1997, pp. 383–384) concluded:

We know that children who grow up in homes characterized by lack of warmth and support, whose parents lack behavior management skills, and whose lives are characterized by conflict or maltreatment will more likely be delinquent, whereas a supportive family can protect children even in a very hostile and damaging external environment. . . . Parental monitoring or supervision is the aspect of family management that is most consistently related to delinquency.

Leschied, Chiodo, Nowicki, and Rodger (2008) conducted a comprehensive meta-analysis of 38 prospective longitudinal studies in which the focus was to establish which, if any, family factors were related to later criminality and antisocial behavior. Taken together, the family factors measured (e.g., parental discipline, substance and child abuse, and family separation) had an effect size (Cohen's d) of 0.25. According to Leschied and colleagues, this can be considered a small effect of family factors on adult antisocial and criminal behavior. However, d = 0.25 corresponds approximately to an absolute 12% difference in conviction rates (e.g., from 56 to 44%, which is a relative 21% decrease; see Farrington & Koegl, 2015). A 21% decrease in offending is more than just a small effect in our view.

Further inspection of the results indicates that some family factors were stronger predictors than others. While parental mental health was not significantly related to later involvement with the criminal justice system, parental management (discipline and supervision) was a significant predictor (d = 0.24, p < .05), along with family structure (e.g., broken family; d = 0.48, p < .01) and an adverse family environment (e.g., parental conflict, poor family functioning, and child abuse; d = 0.23, p < .001). Interestingly, it appears that the effects of family predictors varied somewhat over time and across developmental periods. For example, family structure appeared to have a greater effect when measured in adolescence (d = 0.67, p < 0.6.01), whereas parental management assessed during midchildhood (d = 0.41, p < .001) was most strongly predictive of adult antisociality. These latter findings suggest that the effects of some family factors may be specific to certain developmental periods, which could potentially account for weak relationships reported in other studies focusing on only one specific period of development (Leschied et al., 2008).

Lipsey and Derzon (1998) reviewed evidence regarding predictors at ages 6-11 of serious or violent offending at ages 15–25. The best explanatory predictors (i.e., predictors not indexing some aspect of the child's own antisocial behavior) were antisocial parents, male gender, low socioeconomic status (SES) of the family, and psychological factors such as daring, impulsiveness, and poor concentration. Other moderately strong predictors were minority race, poor parent-child relations (deficient supervision, weak discipline, low parental involvement, low parental warmth), other family characteristics (parent stress, larger family size, parental discord), antisocial peers, low intelligence, and low school achievement. In contrast, Lipsey and Derzon concluded that abusive parents and broken homes were relatively weak predictors. Thus, it is clear from their review that some family factors are at least as important in the prediction of serious and violent offending as are gender and race.

A subsequent meta-analysis by Derzon (2010) of relations between family factors and later antisocial behavior indicated that some factors were differentially related to antisocial outcomes. For example, experiencing a broken home was significantly related to general problem behavior, criminal behavior, and violence, but not to general aggression. Overall, family factors such as childrearing skills, family stress, child maltreatment, and parental antisocial behavior were consistently related to later criminal behavior. Parental discipline (e.g., physical punishment), low SES, and family discord and stability were the family factors that were significantly related to all measured outcomes. Derzon's findings highlight the importance of properly specifying and measuring effects on different outcomes.

Reviewing these kinds of results reveals the bewildering array of family constructs that have been studied and also the variety of methods that have been used to classify them into categories. In the sections of this chapter that follow, family factors are grouped into seven categories: (1) childrearing problems (poor supervision, poor discipline, coldness and rejection, low parental involvement with the child); (2) abuse (physical or sexual) or neglect; (3) parental conflict and disrupted families; (4) large family size; (5) criminal or antisocial parents or siblings; (6) other characteristics of parents (young age, substance abuse, stress, anxiety/ depression); and (7) socioeconomic factors (e.g., low income, poor housing). These groupings are somewhat arbitrary and reflect the organization of topics of investigation within the field. For example, harsh discipline is usually studied along with poor supervision but, at the extreme, it could shade into physical abuse. Physical neglect is usually grouped with physical abuse but, of course, it usually coincides with emotional neglect (cold and rejecting parents). Extrafamilial factors (peer, school, and neighborhood) are discussed later. Finally, findings pertaining to family-based prevention are reviewed.

### **Childrearing Problems**

Many different types of childrearing problems predict offending, as well as chronic offending (Farrington & West, 1993) and high antisocial personality scores (Farrington, 2000). The most important dimensions of childrearing are supervision or monitoring of children, discipline or parental reinforcement, warmth or coldness of emotional relationships, and parental involvement with children. Unlike family size, these constructs are difficult to measure with high reliability and validity, and there is some evidence that the results differ according to the methods of measurement. In their extensive review of parenting methods in relation to childhood antisocial behavior, Rothbaum and Weisz (1994) concluded that the strength of associations between parent and child measures was greater when parenting was measured by observation or interview than when it was assessed using questionnaires.

"Parental supervision" refers to the degree of monitoring by parents of the child's activities, and their degree of watchfulness or vigilance. Of all these childrearing methods, poor parental supervision has been the strongest and most replicable predictor of offending (Farrington & Loeber, 1999; Smith & Stern, 1997), as well as chronic offending (Farrington & West, 1993) and high antisocial personality scores (Farrington, 2000). Many studies show that parents who do not know where their children are when they are out, and parents who let their children roam the streets unsupervised from an early age, tend to have delinquent children. For example, in the classic Cambridge– Somerville study in Boston, poor parental supervision in childhood was the strongest predictor of both violent and property crimes up to age 45 (McCord, 1979).

"Parental discipline" refers to how parents react to a child's behavior. It is clear that harsh or punitive discipline (involving physical punishment) predicts offending, as a review by Haapasalo and Pokela (1999) showed. In a follow-up study of nearly 700 Nottingham children, John and Elizabeth Newson (1989) found that physical punishment at ages 7 and 11 predicted later convictions; 40% of offenders had been smacked or beaten at age 11, compared with 14% of nonoffenders. Erratic or inconsistent discipline also predicts delinquency (West & Farrington, 1973, p. 51). This can involve either erratic discipline by one parent, sometimes turning a blind eye to bad behavior and sometimes punishing it severely, or inconsistency between two parents, with one parent being tolerant or indulgent and the other being harshly punitive. Just as inappropriate methods of responding to bad behavior predict offending, low parental reinforcement (not praising) of good behavior is also a predictor (Farrington & Loeber, 1999).

The Pittsburgh Youth Survey (PYS) is a prospective longitudinal survey of three cohorts of boys originally ages 7, 10, and 13 (Loeber, Farrington, Stouthamer-Loeber, & White, 2008). In the middle cohort, inconsistent discipline at age 13 was a predictor of the interpersonal facet of psychopathy at the age of 24 after researchers controlled for early psychopathic symptoms at age 13, along with 12 other individual and family variables (Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007). Negative parenting, as measured by the Alabama Parenting Questionnaire (Shelton, Frick, & Wootton, 1996), was identified as a robust significant predictor of adolescent psychopathic symptoms when controlling for psychopathic symptoms in childhood, in the 4-year longitudinal study of Frick, Kimonis, Dandreaux, and Farrell (2003). Negative parenting, reflecting poor supervision and discipline and low parental involvement, was a stronger predictor of a wide range of psychopathic symptoms when assessed by parent report compared with youth report. This finding highlights the methodological difficulties in assessing family predictors, since different informants can produce contrasting findings (Frick et al., 2003).

Marshall and Cooke (1999) compared psychopathic and nonpsychopathic prisoners in Scotland using the PCL-R and found that significantly more of the psychopathic prisoners had experienced parental indifference or neglect, poor parental supervision, and poor parental discipline. In the CSDD, poor parental supervision by the G1 parents when the G2 boy was age 8 significantly predicted his high psychopathy scores at age 48. Table 15.2 shows that 24% of boys who were poorly supervised at age 8 (because their parents did not know where they were when they went out) had elevated psychopathy scores at age 48, compared with 8% of the remainder (odds ratio [OR] = 3.6, confidence interval = 1.9-7.0, z = 3.22, p = .001). Generally, an OR of 2.0 or greater indicates a strong relationship (Cohen, 1996). Interestingly, poor parental supervision predicted high antisocial (Factor 2) scores (OR = 3.9) but not elevated affective (Factor 1) scores (OR = 1.9; see Farrington, 2006).

Poor parental supervision, as retrospectively reported by the G3 children, also significantly predicted high psychopathy scores of G3 males (Table 15.3) and G3 females (Table 15.4). Harsh parental discipline by the G1 parents predicted elevated psychopathy scores of the G2 males (Table 15.2). Also, physical punishment by the G2 parents, as reported by the G3 males, predicted high psychopathy scores of the latter (Table15.3), but this was not true for the G3 females (Table 15.4). Low G1 paternal involvement with the G2 boy (the father not joining in with the boy's activities) was a strong predictor of high G2 psychopathy scores (OR = 6.5), but low parental involvement of the G2 father at age 32 did not predict high psychopathy scores among the G3 children.

Most explanations of the link between childrearing methods and later offending focus on social learning or attachment theories. Social learning theories (e.g., Patterson, 1982, 1995) suggest that children's behavior depends on parental rewards and punishments, and on the models of behavior that parents provide. Children tend to become antisocial if parents do not respond consistently and contingently to their bad behavior and if parents themselves behave in an antisocial manner. Attachment theory was inspired by the

	% PCL		
Risk factor (%)	No	Yes	OR
Parental			
Convicted G1 father at 32 (27.0)	5.9	24.4	5.19*
Convicted G1 mother at 32 (13.5)	9.1	22.0	2.80*
Young G1 father (20.7)	9.2	16.1	1.89
Young G1 mother (33.0)	9.4	14.0	1.58
Depressed G1 mother (32.4)	7.7	18.1	2.66*
Family			
Uninvolved G1 father (29.0)	4.4	23.1	6.51*
Harsh discipline (27.9)	8.1	18.5	2.57*
Poor supervision (19.3)	7.8	23.6	3.65*
Parental conflict (21.5)	10.0	15.0	1.58
Disrupted family (21.4)	7.1	24.6	4.26*
Convicted G2 sibling at 10 (8.9)	9.4	25.9	3.38*
Socioeconomic			
Low family income (22.4)	6.8	25.0	4.58*
Large family size (24.0)	7.4	21.9	3.53*
Poor housing (39.5)	6.5	17.5	3.04*
Low socioeconomic status (17.8)	8.4	22.2	3.12*
Delinquent school (18.8)	7.3	23.5	3.92*
Attainment			
Low nonverbal IQ (25.3)	8.4	18.2	2.43*
Low verbal IQ (23.9)	8.3	19.4	2.67*
Low attainment (22.5)	8.6	14.1	1.73
Impulsiveness			
High daring (30.5)	6.7	20.7	3.64*
High impulsivity (25.7)	8.4	17.9	2.38*
High hyperactivity (19.7)	7.8	23.3	3.60*
Behavioral			
High troublesomeness (20.4)	7.9	22.6	3.42*
High dishonesty (24.1)	6.6	22.2	4.07*

TABLE 15.2. Early Predictors of G2 Psychopathy at age 48

*Note.* Figures in the first two columns reflect percentages of males without the risk factor (No) and with the risk factor (Yes) who scored 10+ on the PCL:SV. G2, generation 2; OR, odds ratio; \*p < .05, two-tailed; N's = 224–304.

	% PCL:SV 10+			
Risk factor (%)	No	Yes	OR	
Parental				
Convicted G2 father at 32 (37.1)	9.8	19.6	2.24*	
Convicted G2 mother at 32 (7.0)	11.7	27.8	2.90	
Young G2 father (22.2)	9.3	27.9	3.75*	
Young G2 mother (17.9)	10.5	27.1	3.18*	
Family				
Uninvolved G2 father at 32 (17.7)	15.8	7.9	0.46	
Physical punishment at 32 (38.4)	15.8	12.0	0.73	
Physical punishment from G3 (33.5)	9.3	21.7	2.71*	
Poor supervision at 32 (27.5)	13.3	15.8	1.22	
Poor supervision from G3 (49.5)	5.0	22.1	5.34*	
Parental conflict at 32 (34.3)	13.5	14.1	1.05	
Separated from child at 32 (19.3)	10.7	31.9	3.93*	
Separated from child from G3 (26.3)	10.6	21.1	2.27*	
Convicted G3 sibling at 12 (2.9)	12.8	25.0	2.26	
Socioeconomic				
Low take-home pay at 32 (18.9)	8.1	17.4	2.39	
Large family size at 32 (25.8)	8.5	28.6	4.33*	
Poor housing at 32 (26.8)	7.9	30.0	4.98*	
Low socioeconomic status at 32 (21.0)	10.3	26.3	3.12*	
Attainment				
Early school leaving from G3 (13.9)	9.7	36.8	5.40*	
No A level from G3 (66.8)	2.2	19.1	10.52*	
No undergraduate degree from G3 (86.2)	0.0	15.6	NA	
Impulsiveness				
Risk taking under 12 from G3 (30.2)	7.3	27.7	4.87*	
Poor attention at school from G3 (13.5)	12.6	18.9	1.62	
Behavioral				
Suspended from school from G3 (28.4)	7.6	28.2	4.77*	
Frequent truant from G3 (23.6)	7.6	32.3	5.79*	

TABLE 15.3. Risk Factors for G3 Male Psychopathy

*Note.* Figures in first two columns reflect percentages of those without the risk factor (No) and with the risk factor (Yes) who scored 10+ on the PCL:SV. NA, not applicable; G3, generation 3; OR, odds ratio; \*p < .05, two-tailed; N's = 207–275.

#### ETIOLOGY AND MECHANISMS

	% PCL:SV 6+		
Risk factor (%)	No	Yes	OR
Parental			
Convicted G2 father at 32 (44.6)	7.7	19.1	2.84*
Convicted G2 mother at 32 (11.2)	9.3	29.6	4.11*
Young G2 father (30.9)	7.8	23.8	3.67*
Young G2 mother (24.3)	6.8	29.5	5.70*
Family			
Uninvolved G2 father at 32 (22.9)	11.6	4.3	0.35
Physical punishment at 32 (40.3)	10.0	9.9	0.99
Physical punishment from G3 (30.5)	11.7	15.2	1.36
Poor supervision at 32 (28.7)	10.1	8.9	0.88
Poor supervision from G3 (42.9)	7.4	19.8	3.08*
Parental conflict at 32 (35.6)	6.8	13.8	2.15
Separated from child at 32 (23.4)	8.9	27.3	3.84*
Separated from child from G3 (34.5)	8.5	20.7	2.81*
Convicted G3 sibling at 12 (3.9)	12.7	10.0	0.77
Socioeconomic			
Low take-home pay at 32 (21.7)	7.6	21.3	3.26*
Large family size at 32 (29.5)	12.4	12.2	0.98
Poor housing at 32 (31.9)	9.1	13.4	1.55
Low socioeconomic status at 32 (23.9)	12.0	13.3	1.12
Attainment			
Early school leaving from G3 (15.1)	10.9	23.1	2.45*
No A level from G3 (66.3)	5.7	16.4	3.21*
No undergraduate degree from G3 (85.3)	2.6	14.5	6.26
Impulsiveness			
Risk taking under 12 from G3 (14.3)	10.4	27.0	3.20*
Poor attention at school from G3 (9.3)	11.5	25.0	2.57
Behavioral			
Suspended from school from G3 (11.2)	10.9	27.6	3.12*
Frequent truant from G3 (23.2)	10.6	20.0	2.12

TABLE 15.4. Risk Factors for G3 Female Psychopathy

*Note.* Figures in first two columns reflect percentages of those without the risk factor (No) and with the risk factor (Yes) who scored 6+ on the PCL:SV. NA, not applicable; G3, generation 3; OR, odds ratio; \*p < .05, two-tailed; N's =195–259.

work of Bowlby (1951) and suggests that children who are not emotionally attached to warm, loving, and prosocial parents tend to become antisocial (Carlson & Sroufe, 1995). This theory has some validity for offenders with psyvchopathic tendencies. For example, in a study of high-psychopathy Swedish offenders, Frodi, Dernevik, Sepa, Phillipson, and Bragesjö (2001) found that a high proportion of the offenders had attachment disturbances during childhood.

By contrast, the opposite of poor childrearing, that is good childrearing behavior, may act as a protective factor against the development of psychopathic tendencies. As evidence for this, both Neumann, Wampler, Taylor, Blonigen, and Iacono (2011) and Salihovic, Özdemir, and Kerr (2014) found that good family functioning, prosocial behavior, and parental support were related to reductions in psychopathic symptoms over time. Also, in a Mauritius longitudinal study, Gao, Raine, Chan, Venables, and Mednick (2010) reported that poor parental bonding up to age 16 (retrospectively reported) was related to high psychopathy scores at age 28.

#### Child Abuse and Neglect

Children who are physically abused or neglected tend to become offenders later in life. The most famous study of this was carried out by Widom (1989) in Indianapolis. She used court records to identify over 900 children who had been abused or neglected before age 11, and compared these children with a control group matched on age, race, gender, elementary school class, and place of residence. A 20-year follow-up showed that the children who were abused or neglected were more likely to be arrested as juveniles and as adults than were controls, and that they were more likely to be arrested for juvenile violence (Maxfield & Widom, 1996). Child sexual abuse, along with child physical abuse and neglect, also predicted adult arrests for sex crimes (Widom & Ames, 1994). Most importantly, Luntz and Widom (1994) showed that child abuse predicted adult antisocial personality disorder, and Weiler and Widom (1996) found that child abuse predicted increased PCL-R scores in adulthood, for males as well as females and for both African American and European American children. Childhood neglect also predicted selfreported and official offending in the CSDD (Kazemian, Widom, & Farrington, 2011).

Similar results have been obtained in other studies. An extensive review by Malinosky-Rummell and Hansen (1993) confirmed that being physically abused as a child predicted later violent and nonviolent offending. In Stockholm, Lang, af Klinteberg, and Alm (2002) reported that boys who were abused or neglected at ages 11-14 tended to become violent and to have high PCL-R scores at age 36. Retrospective studies of offenders by Koivisto and Haapasalo (1996) in Finland, by Patrick, Zempolich, and Levenston (1997) in Florida, by Frodi and colleagues (2001) in Sweden, and by Forouzan and Nicholls (2015) in Canada likewise reported correlations between early child abuse and elevated PCL-R scores. However, in a Scottish investigation, Marshall and Cooke (1999) found no difference in physical abuse histories between psychopathic and nonpsychopathic prisoners.

Studies relating early abuse to adolescent and adult psychopathic symptoms have produced somewhat different findings depending on the definition of abuse, sample type, study design, and analytical approach. Harris, Rice, and Lalumière (2001) investigated relationships of antisocial parenting with psychopathy and violence in 868 offenders. Antisocial parenting was measured retrospectively using indicators such as child abuse, neglect/rejection, abuse toward other members in the family, and parental alcoholism. Therefore, this study did not specifically examine physical abuse, but instead examined a wide range of related variables. However, physical child abuse did exhibit the strongest loading on the antisocial parenting measure, which was significantly related (r = .32) to psychopathic symptoms. However, in this retrospective study, it was not possible to establish whether antisocial parenting influenced a child's psychopathic tendencies or vice versa.

As illustrated in other work by Poythress, Skeem, and Lillienfeld (2006), early abuse may be differentially related to the two distinctive factors of psychopathy. These authors assessed psychopathic symptoms, along with retrospectively reported occurrences of early physical, emotional, and sexual abuse, in a sample of 702 North American incarcerated offenders. The results indicated a relationship between overall degree of early abuse and total psychopathy scores, but this relationship was attributable mainly to scores on the irresponsible–antisocial (Factor 2) component of psychopathy. No significant relationship was evident between abuse and scores on the interpersonal–affective (Factor 1) component.

Krischer and Sevecke (2008) investigated potential gender differences in how early abuse affected later psychopathic tendencies in adolescent offenders. Their incarcerated youth had experienced significantly more emotional, physical, and sexual abuse and neglect than a prosocial control group. In regard to psychopathic symptoms, early abuse predicted these symptoms in boys but not in girls. The only significant predictor of psychopathic symptoms in girls was early emotional neglect, which only predicted scores on the antisocial behavior facet. In other work with convicted male sex offenders, Graham, Kimonis, Wasserman, and Kline (2012) found that physical abuse was most strongly related to Factor 2 features of psychopathy, whereas sexual abuse was related to both Factor 1 and Factor 2 features.

The mixed findings presented in this section highlight the complex mechanisms underlying the development of psychopathology (Cicchetti & Rogosch, 1996). Possible environmental causal mechanisms linking childhood victimization and later antisocial behavior were reviewed by Widom (1994). First, childhood victimization may have immediate but long-lasting consequences (e.g., hitting or intense shaking may directly cause brain injury). Second, childhood victimization may produce bodily changes (e.g., desensitization to pain) that encourage later violence. Third, child abuse may lead to impulsive or dissociative coping styles that, in turn, lead to poor problem-solving skills or poor school performance. Fourth, victimization may cause changes in self-esteem or in social information-processing patterns that encourage later violence. Fifth, child abuse may lead to changed family environments (e.g., being placed in foster care) that have deleterious effects. Sixth, juvenile justice practices may label victims, isolate them from prosocial peers, and encourage them to associate with delinquent peers.

#### **Parental Conflict and Disrupted Families**

Bowlby (1951) popularized the theory that broken homes cause delinquency. He argued that maternal love in infancy and childhood was just as important for mental health as were vitamins and proteins for physical health. He maintained that it is essential that a child experience a warm, loving, and continuous relationship with a mother figure. If a child suffers a prolonged period of maternal deprivation during the first 5 years of life, this would have irreversible negative effects, including becoming a cold "affectionless character" and a criminal.

Most studies of broken homes have focused on the loss of the father rather than the mother because the loss of a father is much more common. In general, it has been found that children who have been separated from a biological parent are more likely to offend than children from intact families. For example, in a birth cohort study of children born in Newcastle-upon-Tyne, Kolvin, Miller, Fleeting, and Kolvin (1988) discovered that boys who had experienced divorce or separation in their first 5 years of life had a doubled risk of conviction up to age 32 (53 as opposed to 28%). In line with this, considerable other research shows that frequent changes of parent figures predict offending by children (Krohn, Hall, & Lizotte, 2009; Thornberry, Smith, Rivera, Huizinga, & Stouthamer-Loeber, 1999). In addition, a metaanalysis by Wells and Rankin (1991) indicated that broken homes were more strongly related to delinquency when the cause was parental separation or divorce rather than death.

In a Mauritius longitudinal study, Gao and colleagues (2010) found that separation from both parents at age 3 predicted high psychopathy scores (although the numbers were small). Similarly, in the PYS, Lynam and colleagues (2007), when controlling for other relevant variables (e.g., early psychopathic symptoms), reported that not having two parents in the home at age 13 predicted increased psychopathy scores at age 24. Also, in a retrospective study of criminal women in Canada by Forouzan and Nicholls (2015), high PCL-R scorers tended to have absent fathers in early childhood.

In the CSDD, coming from a disrupted G1 family (separation from a parent before the 10th birthday for reasons other than death or hospitalization) predicted elevated G2 antisocial personality scores at age 32 (Farrington, 2000) and high G2 psychopathy scores at age 48 (Table 15.2). A disrupted G2 family, whether measured prospectively by assessment of the G2 man at age 32 or retrospectively by report of the G3 child, also predicted high G3 male and G3 female psychopathy scores (Tables 15.3 and 15.4). Notably, coming from a disrupted family predicted the antisocial component of psychopathy more strongly than the affective component (Farrington, 2006). However, whereas the retrospective study of Koivisto and Haapasalo (1996) in Finland found a correlation between broken homes and high PCL-R scores, Patrick and colleagues (1997) in Florida reported that psychopathic prisoners were less likely than nonpsychopathic prisoners to come from singleparent homes.

In addition, many studies show that parental conflict and interparental violence predict later antisocial behavior (see Buehler et al., 1997; Ireland & Smith, 2009). In the Christchurch Health and Development Study in New Zealand, children who witnessed violence between their parents were more likely to commit both violent crimes and property offenses according to their self-reports (Fergusson & Horwood, 1998). Notably, the predictive effect of witnessing father-initiated violence held up after researchers controlled for other risk factors such as parental criminality, parental substance abuse, parental physical punishment, a young mother, and low family income. Parental conflict also predicted offending in both the CSDD and PYS (Farrington & Loeber, 1999). However, G1 parental conflict when the G2 boy was age 8 did not significantly predict elevated G2 psychopathy scores subsequently at age 48 (Table 15.2), and G2 parental conflict at age 32 did not predict high psychopathy scores at age 25 in G3 males. Along similar lines, Marshall and Cooke (1999) in Scotland found that psychopathic and nonpsychopathic prisoners did not differ significantly on (retrospectively reported) early parental discord.

Explanations of the relationship between disrupted families and later antisocial behavior fall into three major classes. Trauma theories posit that the loss of a parent has a damaging effect on a child, most commonly because of the effect on attachment to the parent. Life course theories focus on separation as a consequence of stressful experiences, and on the effects of multiple stressors such as parental conflict, parental loss, reduced economic circumstances, changes in parent figures, and poor childrearing methods. Selection theories argue that disrupted families produce delinquent children because of preexisting differences from other families in risk factors such as parental conflict, criminal or antisocial parents, low family income, or poor childrearing methods.

Hypotheses derived from the three theories were tested in the CSDD (Juby & Farrington, 2001). While boys from broken homes (permanently disrupted families) were more delinquent than boys from intact homes, they were not more delinquent than boys from intact high-conflict families. Overall, the most important factor was the postdisruption trajectory. Boys who remained with their mother after the separation had the same delinquency rate as boys from intact lowconflict families. Boys who remained with their father, or with relatives or others (foster parents), had high offending rates. It was concluded that the results favored life course theories rather than trauma or selection theories.

#### Large Family Size

Large family size (a large number of children in the family) is a relatively strong and highly replicable predictor of offending (Ellis, 1988; Fischer, 1984). It was similarly important in the CSDD and PYS, even though families on average were smaller in Pittsburgh in the 1990s than in London in the 1960s (Farrington & Loeber, 1999). In the CSDD, if a boy had four or more siblings by his 10th birthday, this doubled his risk of being convicted as a juvenile (West & Farrington, 1973, p. 31). Large family size was the most important independent predictor of convictions up to age 32 in a logistic regression analysis; 58% of boys from large families were convicted up to this age (Farrington, 1993). Large G1 family size at the G2 boy's 10th birthday also predicted later chronic offending on the part of G2 males (Farrington & West, 1993), elevated antisocial personality scores among G2 males at age 32 (Farrington, 2000), and high psychopathy scores among G2 males at age 48 (Table 15.2). A large G2 family size at age 32 predicted high psychopathy scores among G3 males (Table 15.3), but not among G3 females (Table 15.4).

There are many possible reasons why a large number of siblings might increase the risk of a child's delinquency. Generally, as the number of children in a family increases, the amount of parental attention that can be devoted to each child decreases. Also, as the number of children increases, the household tends to become more overcrowded, possibly leading to increases in frustration, irritation, and conflict. In the CSDD, large family size did not predict delinquency for boys living in the least crowded conditions (i.e., those with two or more rooms than there were children; West & Farrington, 1973, p. 33). This suggests that household overcrowding might be an important factor mediating the association between large family size and offending.

## **Crime Runs in Families**

Criminal and antisocial parents tend to have criminal and antisocial children, as shown in the classic longitudinal surveys by McCord (1977) in Boston and Robins (1979) in St. Louis. The most extensive research on the concentration of offending in families was carried out in the CSDD. Having a convicted father, mother, brother, or sister predicted a boy's own convictions, and all four relatives were independently important as predictors (Farrington, Barnes, & Lambert, 1996). For example, 63% of boys with convicted fathers were themselves convicted up to age 32, compared with 30% of the remainder. Same-sex relationships were stronger than opposite-sex relationships, and older convicted siblings predicted more strongly than younger convicted siblings. Within the CSDD, only 6% of the families accounted for half of all the convictions of all family members.

Similar results were obtained in the PYS. Arrests of fathers, mothers, brothers, sisters, uncles, aunts, grandfathers, and grandmothers all predicted the boy's own delinquency (Farrington, Jolliffe, Loeber, Stouthamer-Loeber, & Kalb, 2001). The most important relative was the father; arrests of the father predicted the boy's delinquency independently of all other arrested relatives. Within the PYS sample, only 8% of families accounted for 43% of arrested family members. Additionally, in Copenhagen, Brennan, Mednick, and Mednick (1993) found that parental psychopathology (including psychopathy) significantly predicted violence by sons up to age 22, and analyses of data from the Dunedin (New Zealand) longitudinal study by Odgers and colleagues (2007) showed that behavior disorders and antisociality of family members predicted conduct disorders in child participants.

Auty, Farrington, and Coid (2015) studied the intergenerational transmission of psychopathy in the CSDD. High Factor 1 (affective–interpersonal) scores of G2 males predicted high Factor 1 scores of G3 males and G3 females. Similarly, high Factor 2 (irresponsible–antisocial) scores of G2 males predicted high Factor 2 scores of G3 males and G3 females. The most important mediating factor between G2 and G3 psychopathy scores was the employment problems of the G2 males at age 32.

In the CSDD, having a convicted parent or a delinquent older sibling by the 10th birthday was consistently among the strongest age 8–10 predictors of the boy's later offending and antisocial behavior. Apart from behavioral measures such as troublesomeness and daring, they were the strongest predictors of juvenile convictions (Farrington, 1992a) and chronic offending (Farrington & West, 1993). Having a convicted G1 parent was the strongest predictor of high G2 antisocial personality scores at age 32 (Farrington, 2000). Table 15.2 shows that having a convicted G1 father, a convicted G1 mother, or a G2 delinquent sibling by the 10th birthday significantly predicted high G2 psychopathy scores at age 48.

Having a convicted G2 father and mother by age 32 was also strongly related to high G3 male and female psychopathy scores (Tables 15.3 and 15.4). A convicted G3 sibling was related to G3 male psychopathy scores, but this relationship was not significant because of small numbers of convicted G3 siblings. A convicted G3 sibling was not related to G3 female psychopathy scores. Bergstrøm, Forth, and Farrington (2016) scored the CSDD boys at ages 12–14 and 16–18 on the Antisocial Process Screening Device (APSD), and found that high psychopathic symptoms scores were predicted by having antisocial family members at age 10.

Farrington and colleagues (2001) reviewed six possible explanations for why antisocial behavior is concentrated in families and transmitted from one generation to the next. First, there may be intergenerational continuities in exposure to multiple risk factors such as poverty, disrupted families, and living in deprived neighborhoods. Second, assortative mating (the tendency of antisocial females to choose antisocial males as partners) facilitates the intergenerational transmission of antisocial behavior. Third, family members may influence each other (e.g., older siblings may encourage younger ones to be antisocial). Fourth, the effect of an antisocial parent on a child's antisocial behavior may be mediated by environmental mechanisms such as poor parental supervision and inconsistent discipline (Thornberry, Freeman-Gallant, & Lovegrove, 2009). Fifth, intergenerational transmission may be mediated by genetic mechanisms. Sixth, there may be labeling and police bias against known criminal families (Besemer, Farrington, & Bijleveld, 2013).

#### **Other Parental Features**

Numerous other parental characteristics predict children's antisocial behavior. For example, early childbearing or teenage pregnancy is a risk factor. Morash and Rucker (1989) analyzed results from four surveys in the United States and England (including the CSDD) and found that teenage mothers tended to coincide with low-income families, and tended to have welfare support and absent biological fathers. In addition, they tended to use poor childrearing methods, and their children often exhibited low school attainment and delinquency. However, the presence of the biological father mitigated many of these adverse factors and generally seemed to have a protective effect (see below).

In the CSDD and the PYS, the age of the mother at her first birth was only a moderate predictor of the boy's later delinquency (Farrington & Loeber, 1999). In the CSDD, for example, 27% of sons of teenage mothers were convicted as juveniles, compared with 18% of the remainder. More detailed analyses in this study showed that teenage mothers who went on to have large numbers of children were especially likely to have convicted children (Nagin, Pogarsky, & Farrington, 1997). It was concluded that the results were concordant with a diminished resources theory: The offspring of adolescent mothers were more crime-prone because they lacked not only economic resources but also personal resources such as attention and supervision.

Since juvenile delinquency is a predictor of the occurrence of an early pregnancy (Smith et al., 2000), the link between young parents and child delinquency may be a consequence of the link between young and criminal parents. In the CSDD, young G1 mothers predicted high G2 antisocial personality scores at age 32 (Farrington, 2000). However, neither young G1 mothers nor young G1 fathers predicted high G2 psychopathy scores (Table 15.2). Nevertheless, young G2 fathers and mothers predicted high G3 male and female psychopathy scores (Tables 15.3 and 15.4). Young G1 and G2 mothers were those who had their first child before age 21, whereas young G1 and G2 fathers were those who had their first child before age 23.

Within the PYS sample, high parental stress, and parental anxiety or depression, predicted delinguency (Loeber, Farrington, Stouthamer-Loeber & van Kammen, 1998). In the CSDD, having a G1 mother who was anxious or depressed (according to psychiatric social worker ratings, a health questionnaire, or psychiatric records) predicted high G2 antisocial personality scores at age 18, but not at age 32 (Farrington, 2000). Table 15.2 shows that the presence of an anxious or depressed G1 mother at the time the G2 boy was age 8-10 predicted high G2 psychopathy scores at age 48. There was no comparable measure of an anxious/ depressed G2 mother at age 32, precluding analyses of relations between G2 maternal anxiety and subsequent G3 psychopathy scores.

Substance use by parents also predicts antisocial behavior on the part of children, according to the findings of the PYS (Loeber et al., 1998). Smoking by the mother during pregnancy is a particularly important risk factor. A large-scale follow-up of a general population cohort in Finland showed that maternal smoking during pregnancy doubled the risk of violent or persistent offending by male offspring, after researchers controlled for other biopsychosocial risk factors (Rasanen et al., 1999). When maternal smoking was combined with a teenage mother, a single-parent family, and an unwanted pregnancy, the risk of offending increased tenfold.

#### Socioeconomic Factors

In general, coming from a low-social-class family predicts later violence. For example, in the U.S. National Youth Survey, prevalence rates for selfreported assault and robbery were about twice as high among lower-class youth as among middleclass youth (Elliott, Huizinga, & Menard, 1989). In Project Metropolitan in Stockholm (Wikström, 1985) and in the Dunedin study in New Zealand (Henry, Caspi, Moffitt, & Silva, 1996), the low socioeconomic status of a boy's family—based on the father's occupation—predicted his later violent crimes.

Low SES is a less consistent predictor of psychopathic tendencies. One potential source of variability relates to whether SES is measured by income and housing or by occupational prestige. In the previously mentioned 4-year longitudinal study of psychopathic symptoms in children and adolescence, Frick and colleagues (2003) found that low SES was a significant predictor of adolescent psychopathic symptoms (callous-unemotional traits). Since they controlled for earlier psychopathic symptoms, it can be concluded that low SES is an independent predictor of increased psychopathy scores. In the PYS, Lynam and colleagues (2008) investigated factors that increased the stability of psychopathic tendencies over time. Family SES significantly influenced the relationship but in a rather surprising direction: The stability of psychopathic symptoms was greatest among high-SES boys.

In the CSDD, low family income and poor housing predicted both official and self-reported juvenile and adult offending, but low parental occupational prestige predicted only self-reported offending (Farrington, 1992a, 1992b). Also, low G1 family income and low G1 SES (but not poor housing) significantly predicted high G2 antisocial personality scores at age 32 (Farrington, 2000). Table 15.2 shows that low G1 family income when the G2 boy was age 8, low G1 SES at ages 8–10 (based on occupational prestige), and poor G1 housing at ages 8–10 all predicted high G2 psychopathy scores at age 48. Also, low G2 income at age 32, poor G2 housing, and low G2 SES all predicted elevated G3 male psychopathy scores, but only low G2 income predict high G3 female psychopathy scores (Tables 15.3 and 15.4). In their retrospective study, Patrick and colleagues (1997) found no significant relationship between SES and PCL-R scores among prisoners.

#### Peer, School, and Neighborhood Factors

It is well established that having delinquent friends is an important predictor of offending (Lipsey & Derzon, 1998), and youth who are high on psychopathic symptoms tend to associate with antisocial peers (Muñoz, Kerr, & Besic, 2008). What is less clear is whether antisocial peers encourage and facilitate adolescent antisocial behavior, or whether it is merely the case that "birds of a feather flock together." Delinquents may have delinquent friends because of co-offending, which is particularly common under age 21 (Reiss & Farrington, 1991). However, Elliott and Menard (1996) in the U.S. National Youth Survey concluded that delinquent friends influenced an adolescent's own delinquency, and that the reverse was also true: Highly delinquent adolescents were more likely to have delinquent friends. In the CSDD, antisocial peers at ages 12–14 predicted psychopathic symptoms scores on the APSD at ages 16-18 (Bergstrøm et al., 2016).

There is no doubt that highly aggressive children tend to be rejected by most of their peers (Coie, Dodge, & Kupersmidt, 1990). In the Oregon Youth Study, peer rejection at ages 9–10 significantly predicted adult antisocial behavior at ages 23–24 (Nelson & Dishion, 2004). In Stockholm, Freidenfelt and af Klinteberg (2003) found that unpopularity predicted high psychopathy scores among hyperactive boys but not among nonhyperactive boys. Low popularity at ages 8–10 was only a marginal predictor of adolescent aggression and teenage violence in the CSDD (Farrington, 1989). It significantly predicted chronic offending (Farrington & West, 1993) but not high antisocial personality scores at age 32 (Farrington, 2000). There is some evidence suggesting that social competency might act as a protective factor against the development of psychopathic tendencies. In their three-wave longitudinal study of children, Barry, Barry, Deming, and Lochman (2008) found an association between social competency and decreased levels of both affective–interpersonal (Factor 1) and irresponsible–antisocial (Factor 2) psychopathic symptoms.

It is also well established that delinquents disproportionately attend high-delinguency-rate schools, which tend to have high levels of distrust between teachers and students, low commitment to the school by students, and unclear and inconsistently enforced rules (Graham, 1988). In the CSDD, attending a high-delinquency-rate school at age 11 significantly predicted a boy's own delinquency (Farrington, 1992a), as well as chronic offending (Farrington & West, 1993), and high antisocial personality scores on his part at age 32 (Farrington, 2000). Table 15.2 shows that attending a high-delinquency-rate school also predicted high G2 psychopathy scores. There was no comparable school measure for the G3 children, precluding comparable analyses for G3 psychopathy scores.

It is less clear how much the schools themselves influence antisocial behavior by their organization, climate, and practices, and how much the concentration of offenders in certain schools is mainly a function of their intake practices. In the CSDD, most of the variation between schools in delinquency rates could be explained by differences in their intake of troublesome boys at age 11 (Farrington, 1972). However, reviews of American research show that schools with clear, fair, and consistently enforced rules tend to have low rates of student misbehavior (Gottfredson, 2001; Herrenkohl, Hawkins, Chung, Hill, & Battin-Pearson, 2001).

Many studies show that boys living in urban areas are more violent than those living in rural ones (Derzon, 2010; Foster & Brooks-Gunn, 2013). In the U.S. National Youth Survey, the prevalence of self-reported assault and robbery was considerably higher among urban youth (Elliott et al., 1989). Within urban areas, boys living in highcrime neighborhoods are more violent than those living in low-crime neighborhoods. For example, in the Rochester Youth Development Study, living in a high-crime neighborhood significantly predicted self-reported violence (Thornberry, Huizinga, & Loeber, 1995). Similarly, in the PYS, living in a bad neighborhood (either as rated by the mother, or based on census measures of poverty, unemployment, and female-headed households) significantly predicted official and reported violence (Farrington, 1998).

It is clear that offenders disproportionately live in inner-city areas characterized by physical deterioration, neighborhood disorganization, and high residential mobility (Shaw & McKay, 1969). However, again, it is difficult to determine how much the areas themselves influence antisocial behavior and how much it is merely the case that antisocial people tend to congregate in deprived areas (e.g., because of their poverty, or because of public housing allocation policies). Interestingly, both neighborhood researchers such as Gottfredson, McNeil, and Gottfredson (1991), and developmental researchers such as Rutter (1981) have concluded that neighborhoods exert only indirect effects on antisocial behavior via their effects on individuals and families. However, Sampson, Raudenbush, and Earls (1997) argued that a low degree of "collective efficacy" in a neighborhood (a low degree of informal social control) contributes causally to high crime rates.

Little is known about the influence of areas of residence on psychopathic symptoms. However, in the PYS, Lynam and colleagues (2007) found that boys who lived in high- and medium-SES neighborhoods at age 13 were significantly less likely than other boys to show antisocial (Facet 4) symptoms at age 24.

### Other Risk Factors

Table 15.2 also shows the degree to which other well-known risk factors, assessed when the G2 boys were ages 8–10 in the CSDD, predicted high G2 psychopathy scores at age 48. Low nonverbal IQ and low verbal IQ, but not low primary school attainment, predicted high G2 psychopathy scores at age 48. High daring (taking many risks), poor concentration or restlessness, and high impulsivity on psychomotor tests all predicted the most psychopathic males. High dishonesty (rated by peers) and high troublesomeness (rated by peers and teachers) also significantly predicted high psychopathy scores at age 48. Similar results were obtained in regard to the predictors of G3 male and female high psychopathy scores (Tables 15.3) and 15.4): Measures of low attainment, early risk taking, and antisocial school behavior were all significant predictors, although these measures were based on retrospective reports.

Tables 15.2, 15.3, and 15.4 are only the starting point for analyzing the development and causes of adult psychopathy. More detailed multivariate research is needed to investigate how childhood risk factors predict juvenile psychopathic symptoms, and how later risk factors influence the continuity from juvenile to adult psychopathy. These more detailed analyses, which should include evaluation of distinct predictors of affective–interpersonal and irresponsible–antisocial factor scores, are outside the scope of this review chapter.

#### Key Methodological Issues

It is difficult to determine what precise causal mechanisms link family factors—such as parental criminality, young mothers, large family size, poor parental supervision, child abuse, or disrupted families-to later antisocial behavior or psychopathy. This is because such factors tend to be related not only to one another but also to other risk factors, such as low family income, poor housing, impulsiveness, low IQ, and low school attainment. To help clarify the mechanisms by which family factors affect antisocial outcomes, it will be important to direct effort toward identifying family factors that predict psychopathy, independent of other family factors, and independent of nonfamily environmental (e.g., peer, neighborhood, and socioeconomic) factors and individual (e.g., psychological, genetic, or biological) factors.

The role of gender is also important to consider. It might be expected that family factors would exert different effects on boys as compared to girls, since there are well-documented gender differences in childrearing experiences. In particular, boys are more likely to receive physical punishment from parents (Lytton & Romney, 1991; Smith & Brooks-Gunn, 1997). However, in their extensive review of gender differences in antisocial behavior, Moffitt, Caspi, Rutter, and Silva (2001) concluded that boys were more antisocial not because of gender differences in the strength of relationships between risk factors and antisocial behavior, but because boys were exposed to more risk factors or a higher level of risk. Consistent with the idea that differential risk exposure rather than differential strength of relationships accounts for gender differences, many risk factors in Tables 15.3 and 15.4 predicted both G3 male and female psychopathy scores.

Race and ethnicity are also important to consider. For example, family factors may have different effects on African American and European American children in the United States. Evidence indicates that, although African American children are more likely to be physically punished, physical punishment is more related to antisocial behavior for European American children than for African American children (Deater-Deckard, Dodge, Bates, & Pettit, 1996; Kelley, Power, & Wimbush, 1992). In the PYS, 21% of European American boys who were physically punished (slapped or spanked) by their mothers were violent, compared with 8% of those who were not physically punished. In contrast, 32% of African American boys who were physically punished were violent, compared with 28% of those who were not physically punished (Farrington, Loeber, & Stouthamer-Loeber, 2003). It was suggested that physical punishment may have a different meaning within African American families. Specifically, in these families, the use of such punishment may indicate warmth and concern for the child, whereas in European American families it tends to be associated with a cold and rejecting parental attitude.

It will also be important to devote investigative attention to sequential effects of risk factors on psychopathy. Several researchers have concluded that socioeconomic factors influence proneness to offending through their impact on family factors (see Dodge, Pettit, & Bates, 1994; Larzelere & Patterson, 1990; Stern & Smith, 1995). In the PYS, for example, it was proposed that socioeconomic and neighborhood factors (e.g., poor housing) influenced family factors (e.g., poor supervision), which in turn influenced child factors (e.g., low guilt), and in turn influenced offending (Loeber et al., 1998, p.10). There may also be sequential effects of some family factors on others (e.g., if young mothers tend to use poor childrearing methods; see Conger, Patterson & Ge, 1995), or of family factors on other risk factors (e.g., the tendency for antisocial parents to have low incomes and live in poor neighborhoods).

Just as parental childrearing methods influence characteristics of children, so child characteristics may influence parenting, as suggested by Lytton (1990). For example, an antisocial child who is uncooperative and abrasive is likely to provoke more punishment from a parent than a well-behaved child. As evidence for this, in a longitudinal survey of children living in upper New York State, Cohen and Brook (1995) found that there were reciprocal influences between parental punishment and child behavior disorder.

This reciprocal effect has also been demonstrated for psychopathic symptoms in a large Swedish sample. Based on the assumption that neither parental behavior nor psychopathic tendencies are static, unchangeable constructs, Salihovic, Kerr, Özdemir, and Pakalniskiene (2012) investigated the potential impact of these two variables on each other over time. Their 4-year prospective longitudinal study followed over 800 adolescents from ages 13-15 to approximately ages 17-19. By measuring both psychopathic symptoms and parental behavior during this period, the authors were able to assess how parental behavior impacted psychopathic symptoms and vice versa. The results indicated that parental behavior became less warm and understanding as a result of the adolescent's increased manifestation of psychopathic symptoms, and vice versa. This bidirectional relationship highlights the difficulties in assessing the influence of family factors on psychopathy, as both can change over time and influence each other (Salihovic et al., 2012).

### **Family-Based Prevention**

Since family factors predict antisocial behavior, it is likely that family-based prevention can reduce antisocial behavior (Farrington & Welsh, 2003, 2007). However, there are few family prevention and treatment programs designed for people who are high in psychopathic tendencies (Salekin, 2002; Salekin, Worley, & Grimes, 2010), and few outcome measures of psychopathy in family intervention research. As a result, it is necessary to focus the discussion on prevention methods that target general offending and antisocial behavior. In the most famous intensive home visiting program, implemented in Elmira (New York), Olds, Henderson, Chamberlin, and Tatelbaum (1986) randomly allocated 400 mothers to groups that received (1) home visits from nurses during pregnancy, (2) visits during pregnancy and during the first 2 years of life, or (3) no visits (control group). Each visit lasted about one and one-quarter hours, and the mothers were visited on average every 2 weeks. The home visitors gave advice about prenatal and postnatal care of the child, infant development, and the importance of proper nutrition and avoidance of smoking and drinking during pregnancy. Therefore, this was a general parent education program.

The results of this experimental study showed that the postnatal home visits caused a decrease in

recorded child physical abuse and neglect during the first 2 years of life, especially by poor unmarried teenage mothers: 4% of visited versus 19% of nonvisited mothers within this category were guilty of child abuse or neglect. In a 15-year followup, the main focus was on lower-class unmarried mothers. Among mothers in this category, those who received prenatal and postnatal home visits had fewer arrests than those who received prenatal visits or no visits (Olds et al., 1997). Additionally, children of these mothers who received prenatal and/or postnatal home visits had less than half as many arrests as children of mothers who received no visits (Eckenrode et al., 2010; Olds et al., 1998). Other studies (Bilukha et al., 2005; Kitzman et al., 1997) have likewise shown that intensive home visiting can reduce later antisocial behavior of children.

Webster-Stratton and Hammond (1997) evaluated the effectiveness of parent training and child skills training with about 100 Seattle children (average age 5) referred to a clinic because of conduct problems. The children and their parents were randomly allocated to groups receiving (1) parent training, (2) child skills training, (3) both parent and child training, or (4) no training (control group). The skills training was designed to foster prosocial behavior and interpersonal skills in child participants using video modeling, while the parent training entailed weekly skills-training sessions between parents and therapists for 22-24 weeks. Parent reports and home observations showed that children in all three experimental conditions had fewer behavior problems than control children, both in an immediate and in a 1-year follow-up. There was little difference between the three experimental conditions, although the combined parent- and child-training condition produced the most significant improvements in child behavior at the 1-year follow-up.

Scott, Spender, Doolan, Jacobs, and Aspland (2001) evaluated the Webster-Stratton parent training program (see e.g., Webster-Stratton, Rinaldi, & Janila, 2011) in London, England. About 140 children, ages 3–8, referred for antisocial behavior were allocated to receive parent training or to be in a control group. The program was again successful: According to parent reports, the antisocial behavior of the experimental children decreased, whereas that of the control children did not change. Scott and colleagues (2010) similarly found in their randomized controlled trial of the Supporting Parents on Kids Education in Schools ("SPOKES") program that antisocial children of parents who utilized the taught techniques (experimental group) improved substantially in the follow-up assessment 1 year later compared to the control group. Other studies have also yielded evidence for the effectiveness of parent training in reducing children's antisocial behavior (Kazdin, Siegel, & Bass, 1992; Piquero et al., 2016).

In other work, in Brisbane, Australia, Sanders, Markie-Dadds, Tully, and Bor (2000) developed the Triple-P Positive Parenting program, which can be delivered as either primary prevention to the community as a whole using the mass media or as secondary prevention with high-risk or clinic samples. Sanders and colleagues evaluated the success of Triple-P with high-risk children age 3 by randomly allocating them to receive either Triple-P or to be in a control group. The Triple-P program involves teaching parents 17 child management strategies that include talking with children, giving physical affection, praising, giving attention, setting a good example, setting rules, giving clear instructions, and using appropriate penalties for misbehavior (i.e., "time-out," or sending the child to his or her room). The evaluation showed that the Triple-P program was successful in reducing children's antisocial behavior. The effectiveness of Triple-P was confirmed in meta-analyses by Sanders, Kirby, Tellegen, and Day (2014) and Thomas and Zimmer-Gembeck (2007).

Another parenting intervention, termed "functional family therapy," was developed in Utah by Alexander and Parsons (1973; see also Alexander, Barton, Schiavo, & Parsons, 1976). This intervention was designed to modify patterns of family interaction by modeling, prompting, and reinforcement, in order to encourage clear communication among family members regarding requests and solutions, and to minimize conflict. Essentially, all family members were trained to negotiate effectively, to set clear rules about privileges and responsibilities, and to use techniques of reciprocal reinforcement with each other. The program was evaluated by randomly allocating 86 delinquent participants to experimental or control conditions. The results showed that this technique halved the recidivism rate of delinquent individuals in comparison with other approaches (client-centered or psychodynamic therapy). Its effectiveness with more serious offenders has been replicated in many studies with high-quality designs (Barton, Alexander, Waldron, Turner, & Warburton, 1985; Sexton & Alexander, 2000; Sexton & Turner, 2010).

In Oregon, Chamberlain and Reid (1998) evaluated treatment foster care (TFC) as an alternative to custody for delinquents. Custodial sentences for delinquents were thought to have undesirable effects, especially because of the bad influence of delinquent peers. In TFC, families in the community were recruited and trained to provide placements for delinquent youth. The TFC youth were closely supervised at home, in the community, and in the school, and their contacts with delinquent peers were thereby minimized. The foster parents provided a structured daily living environment with clear rules and limits, consistent discipline for rule violations, and one-to-one monitoring. The youth were encouraged to develop academic skills and desirable work habits. In the evaluation by Chamberlain and Reid, 79 chronic male delinquents were randomly assigned to TFC or to regular group homes, where they lived with other delinquent youth. A 1-year follow-up showed that the TFC boys had fewer criminal referrals and lower self-reported delinquency. The authors concluded that this program was effective for treating chronic delinquency. Hahn and colleagues (2005) and MacDonald and Turner (2007) corroborated this conclusion in comprehensive systematic reviews that further supported the use of TFC with youth at risk.

Generally, multimodal interventions are more effective for reducing antisocial tendencies than single-modality interventions (Wasserman & Miller, 1998). For example, multisystemic therapy (MST) is an important multiple-component family preservation program developed for chronic delinquents in South Carolina by Henggeler, Melton, Smith, Schoenwald, and Hanley (1993). In this approach, the particular type of treatment is chosen according to particular needs of the youth. Therefore, the nature of the treatment is different for each person. MST is delivered in the youth's home, school, and community settings. The treatment typically includes family intervention to promote the parent's ability to monitor and discipline the adolescent, peer intervention to encourage the choice of prosocial friends, and school intervention to enhance competence and school achievement.

Curtis, Ronan, and Borduin (2004) conducted a statistical review of 11 studies (N = 708) evaluating the effectiveness of MST for a wide range of outcomes such as delinquency, substance abuse, and truancy. The meta-analysis showed an overall significant effect (d = 0.55) of the program. In a more recent comprehensive review of the MST program, Henggeler (2011) summarized relevant studies that evaluated the program's effectiveness. The included studies consisted mainly of randomized controlled trials (RCTs), spanned more than two decades, and evaluated outcomes such as delinquency, family functioning, and placements outside of the home. While no statistical effects were summarized, the review concluded that there were improvements in all these areas.

Manders, Dekovic, Asscher, van der Laan, and Prins (2013) investigated the effectiveness of MST in reducing psychopathic symptoms in adolescents. Over 200 youth around the age of 16 received either MST or traditional treatment in an RCT. The results indicated that, compared to traditional treatment, MST contributed to decreases in the narcissistic and impulsiveness dimensions of adolescent psychopathic symptoms. However, the differences between conditions were not significant. Interestingly, psychopathic tendencies moderated treatment success: MST was more successful with adolescents who were low in psychopathic symptoms than with those who were high in psychopathy (Manders et al., 2013).

While there are many evaluations suggesting that family-based prevention programs are effective, few have included a long-term follow-up, and few have focused on psychopathic symptoms. Future studies evaluating early prevention programs should include long-term follow-ups and a wide range of outcome measures, including assessment of psychopathic tendencies.

#### **Conclusions and Future Directions**

As Salekin (2002) and Manders and colleagues (2013) argued, further research is necessary to establish causal mechanisms in the development of psychopathy. More explanatory research is needed on psychopathy. Greater effort should be devoted to integrating dispositional tendencies characteristic of psychopathy—an arrogant and deceitful interpersonal style, deficient affective experience, and an impulsive and irresponsible lifestylewith broader dimensional models of personality (Lynam et al., 2005; Widiger, 1998). More research is needed on the development of more unbiased, valid, and reliable instruments to measure psychopathy-preferably measures that are not contaminated by antisocial behavior and that do not rely on open-ended questions. In developing alternative assessment instruments, it will be important to supplement self-report data with other information (e.g., from case files). Cross-cultural comparisons are also needed (see, e.g., Cooke, Michie, Hart, & Clark, 2005).

**ACKNOWLEDGEMENTS** The age 8–10 data collection of by the Home Office and direct

The age 8–10 data collection of the CSDD was funded by the Home Office and directed by Donald West. The age 32 data collection was funded by the Home Office and directed by David P. Farrington. The medical interview with the G2 males at age 48 was funded by the U.K. National Programme on Forensic Mental Health and codirected by Jeremy Coid and David P. Farrington. The interviews with the G3 children were funded by the Department of Health, the Department for Education, the Rayne Foundation, the Barrow Cadbury Trust, and the Smith Richardson Foundation, and were codirected by David P. Farrington and Jeremy Coid.

#### REFERENCES

- Alexander, J. F., Barton, C., Schiavo, R. S., & Parsons, B. V. (1976). Systems-behavioral intervention with families of delinquents: Therapist characteristics, family behavior, and outcome. Journal of Consulting and Clinical Psychology, 44, 656–664.
- Alexander, J. F., & Parsons, B. V. (1973). Short-term behavioral intervention with delinquent families: Impact on family process and recidivism. *Journal of Abnormal Psychology*, 81, 219–225.
- Andershed, H. (2010). Stability and change of psychopathic traits: What do we know? In R. T. Salekin & D. R. Lynam (Eds.), *Handbook of child and adolescent psychopathy* (pp. 233–250). New York: Guilford Press.
- Auty, K. M., Farrington, D. P., & Coid, J. W. (2015). Intergenerational transmission of psychopathy and mediation via psychosocial risk factors. *British Journal of Psychiatry*, 206, 26–31.
- Barry, T. D., Barry, C. T., Deming, A. M., & Lochman, J. E. (2008). Stability of psychopathic characteristics in childhood: The influence of social relationships. *Criminal Justice and Behavior*, 35, 244–262.
- Barton, C., Alexander, J. F., Waldron, H., Turner, C. W., & Warburton, J. (1985). Generalizing treatment effects of functional family therapy: Three replications. *American Journal of Family Therapy*, 13, 16–26.
- Bergstrøm, H., Forth, A. E., & Farrington, D. P. (2016). The psychopath: Continuity or change? Stability of psychopathic traits and predictors of stability. In A. Kapardis & D. P. Farrington (Eds.), The psychology of crime, policing and courts (pp. 56–74). London: Routledge.
- Besemer, S., Farrington, D. P., & Bijleveld, C. C. J. H. (2013). Official bias in intergenerational transmission of criminal behaviour. *British Journal of Crimi*nology, 53, 438–455.
- Bilukha, O., Hahn, R. A., Crosby, A., Fullilove, M. T., Liberman, A., Moscicki, E., et al. (2005). The effectiveness of early childhood home visitation in preventing violence. *American Journal of Preventive Medicine*, 28(2, Suppl. 1), 11–39.
- Bowlby, J. (1951). Maternal care and mental health. Geneva: World Health Organization.

The aim of efforts along these lines should be to formulate and test causal models of psychopathy or of its constituent constructs, such as low empathy and high impulsiveness. There should be more integration of psychopathy research with developmental and life-course criminology (Fox, Jennings, & Farrington, 2015). In this regard, there is a critical need to carry out prospective longitudinal surveys with high-risk community samples to investigate the development of psychopathy, and to account for observed links between psychopathic tendencies of parents and their children. In studying family factors, better measurement instruments are needed, with increased reliance on systematic observation of family interactions. More randomized experiments are needed to evaluate familybased interventions, with large samples and longterm follow-up periods, incorporating outcome measures of psychopathy. In principle, a great deal can be learned about causal effects of family factors from experiments of this type (Robins, 1992).

In addition, there is a pressing need for more research on independent, interactive, and sequential effects of family and other factors (e.g., biological, psychological, and environmental) on the development of psychopathy. Research should aim in particular to identify protective effects, for example, by studying family environments in which at-risk individuals (e.g., those with a biological risk factor) do not develop psychopathy (Salekin & Lochman, 2008). In addition, there should be more interplay between causal and intervention research. For example, causal research findings might be helpful for matching types of interventions to subgroups of individuals. Additionally, systematic reviews and meta-analyses should be carried out to assess the importance of both causal factors and intervention programs.

No one can doubt the importance of psychopathy as a clinical condition, the need to develop better operational definitions of the dispositional constructs that underlie it, and the pressing need to advance what we know about its origins and development, and about how best to prevent and treat it. The time is ripe for Western countries to mount an ambitious coordinated program of research on psychopathy, focusing on international multidisciplinary collaboration and training a new generation of biopsychosocial researchers. Given the enormous social costs of psychopathy, the benefits of such a large-scale coordinated program of research should easily outweigh its costs. And, of course, reductions in the prevalence of psychopathic individuals and the numbers of their victims would contribute greatly to the sum of human happiness.

- Brennan, P. A., Mednick, B. R., & Mednick, S. A. (1993). Parental psychopathology, congenital factors, and violence. In S. Hodgins (Ed.), *Mental disorder* and crime (pp. 244–261). Newbury Park, CA: SAGE.
- Buehler, C., Anthony, C., Krishnakumar, A., Stone, G., Gerard, J., & Pemberton, S. (1997). Interparental conflict and youth problem behaviors: A meta-analysis. Journal of Child and Family Studies, 6, 233–247.
- Campbell, M. A., Porter, S., & Santor, D. (2004). Psychopathic traits in adolescent offenders: An evaluation of criminal history, clinical, and psychosocial correlates. *Behavioral Sciences and the Law*, 22, 23–47.
- Carlson, E. A., & Sroufe, L. A. (1995). Contribution of attachment theory to developmental psychopathology. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology* (Vol. 1, pp. 581–617). New York: Wiley.
- Chamberlain, P., & Reid, J. B. (1998). Comparison of two community alternatives to incarceration for chronic juvenile offenders. *Journal of Consulting and Clinical Psychology*, 66, 624–633.
- Cicchetti, D., & Rogosch, F. A. (1996). Equifinality and multifinality in developmental psychopathology. *De*velopment and Psychopathology, 2, 597–600.
- Cohen, P. (1996). Childhood risks for young adult symptoms of personality disorder. *Multivariate Behavioral Research*, 31, 121–148.
- Cohen, P., & Brook, J. S. (1995). The reciprocal influence of punishment and child behavior disorder. In J. McCord (Ed.), Coercion and punishment in long-term perspectives (pp. 154–164). Cambridge, UK: Cambridge University Press.
- Coie, J. D., Dodge, K. A., & Kupersmidt, J. (1990). Peer group behavior and social status. In S. R. Asher & J. D. Coie (Eds.), *Peer rejection in childhood* (pp. 17–59). Cambridge, UK: Cambridge University Press.
- Conger, R. D., Patterson, G. R., & Ge, X. (1995). It takes two to replicate: A mediational model for the impact of parents' stress on adolescent adjustment. *Child Development*, 66, 80–97.
- Cooke, D. J., Michie, C., Hart, S. D., & Clark, D. A. (2004). Reconstructing psychopathy: Clarifying the significance of antisocial and socially deviant behavior in the diagnosis of psychopathic personality disorder. Journal of Personality Disorders, 18, 337–357.
- Cooke, D. J., Michie, C., Hart, S. D., & Clark, D. A. (2005). Assessing psychopathy in the UK: Concerns about cross-cultural generalizability. *British Journal of Psychiatry*, 186, 335–341.
- Cooke, D. J., Michie, C., Hart, S. D., & Hare, R. D. (1999). Evaluating the screening version of the Psychopathy Checklist—Revised (PCL:SV): An item response theory analysis. *Psychological Assessment*, 11, 3–13.
- Curtis, N. M., Ronan, K. R., & Borduin, C. M. (2004). Multisystemic treatment: A meta-analysis of outcome studies. Journal of Family Psychology, 18, 411–419.
- Deater-Deckard, K., Dodge, K. A., Bates, J. E., & Pettit, G. S. (1996). Physical discipline among African

American and European American mothers: Links to children's externalizing behaviors. *Developmental Psychology*, 32, 1065–1072.

- Derzon, J. H. (2010). The correspondence of family features with problem, aggressive, criminal and violent behavior: A meta-analysis. *Journal of Experimental Criminology*, 6, 263–292.
- Dodge, K. A., Pettit, G. S., & Bates, J. E. (1994). Socialization mediators of the relation between socioeconomic status and child conduct problems. *Child Development*, 65, 649–665.
- Eckenrode, J., Campa, M., Luckey, D. W., Henderson, C. R., Cole, R., Kitzman, H., et al. (2010). Long-term effects of prenatal and infancy nurse home visitation on the life course of youths: 19 year follow-up of a randomized trial. Archives of Pediatric and Adolescent Medicine, 164, 9–15.
- Elliott, D. S., Huizinga, D., & Menard, S. (1989). Multiple problem youth. New York: Springer-Verlag.
- Elliott, D. S., & Menard, S. (1996). Delinquent friends and delinquent behavior: Temporal and developmental patterns. In J. D. Hawkins (Ed.), *Delinquency and crime: Current theories* (pp. 28–67). Cambridge, UK: Cambridge University Press.
- Ellis, L. (1988). The victimful–victimless crime distinction, and seven universal demographic correlates of victimful criminal behavior. *Personality and Individu*al Differences, 3, 525–548.
- Farrington, D. P. (1972). Delinquency begins at home. New Society, 21, 495–497.
- Farrington, D. P. (1989). Early predictors of adolescent aggression and adult violence. Violence and Victims, 4, 79–100.
- Farrington, D. P. (1992a). Explaining the beginning, progress, and ending of antisocial behavior from birth to adulthood. In J. McCord (Ed.), Facts, frameworks and forecasts: Advances in criminological theory (Vol. 3, pp. 253–286). New Brunswick, NJ: Transaction.
- Farrington, D. P. (1992b). Juvenile delinquency. In J. C. Coleman (Ed.), *The school years* (2nd ed., pp. 123– 163). London: Routledge.
- Farrington, D. P. (1993). Childhood origins of teenage antisocial behaviour and adult social dysfunction. *Journal of the Royal Society of Medicine*, 86, 13–17.
- Farrington, D. P. (1998). Predictors, causes, and correlates of youth violence. In M. Tonry & M. H. Moore (Eds.), Youth violence (pp. 421–475). Chicago: University of Chicago Press.
- Farrington, D. P. (2000). Psychosocial predictors of adult antisocial personality and adult convictions. Behavioral Sciences and the Law, 18, 605–622.
- Farrington, D. P. (2003). Key results from the first 40 years of the Cambridge Study in Delinquent Development. In T. P. Thornberry & M. D. Krohn (Eds.), *Taking stock of delinquency* (pp. 137–183). New York: Kluwer Academic/Plenum Press.
- Farrington, D. P. (2006). Family background and psychopathy. In C. J. Patrick (Ed.), Handbook of psychopathy (pp. 229–250). New York: Guilford Press.

- Farrington, D. P. (2015). Prospective longitudinal research on the development of offending. Australian and New Zealand Journal of Criminology, 48, 314–335.
- Farrington, D. P., Barnes, G., & Lambert, S. (1996). The concentration of offending in families. *Legal and Criminological Psychology*, 1, 47–63.
- Farrington, D. P., Coid, J. W., Harnett, L., Jolliffe, D., Soteriou, N., Turner, R., et al. (2006). Criminal careers up to age 50 and life success up to age 48: New findings from the Cambridge Study in Delinquent Development (Research Study No. 299). London: Home Office.
- Farrington, D. P., Coid, J. W., & West, D. J. (2009). The development of offending from age 8 to age 50: Recent results from the Cambridge Study in Delinquent Development. Monatsschrift fur Kriminologie und Strafrechtsreform (Journal of Criminology and Penal Reform), 92, 160–173.
- Farrington, D. P., Jolliffe, D., Loeber, R., Stouthamer-Loeber, M., & Kalb, L. M. (2001). The concentration of offenders in families, and family criminality in the prediction of boys' delinquency. *Journal of Adolescence*, 24, 579–596.
- Farrington, D. P., & Koegl, C. J. (2015). Monetary benefits and costs of the Stop Now And Plan program for boys aged 6–11, based on the prevention of later offending. *Journal of Quantitative Criminology*, 31, 263–287.
- Farrington, D. P., & Loeber, R. (1999). Transatlantic replicability of risk factors in the development of delinquency. In P. Cohen, C. Slomkowski, & L. N. Robins (Eds.), *Historical and geographical influences* on psychopathology (pp. 299–329). Mahwah, NJ: Erlbaum.
- Farrington, D. P., Loeber, R., & Stouthamer-Loeber, M. (2003). How can the relationship between race and violence be explained? In D. F. Hawkins (Ed.), *Violent crime: Assessing race and ethnic differences* (pp. 213–237). Cambridge, UK: Cambridge University Press.
- Farrington, D. P., Piquero, A. R., & Jennings, W. G. (2013). Offending from childhood to late middle age: Recent results from the Cambridge Study in Delinquent Development. New York: Springer.
- Farrington, D. P., & Ttofi, M. M. (2012). Protective and promotive factors in the development of offending. In T. Bliesener, A. Beelman, & M. Stemmler (Eds.), Antisocial behaviour and crime: Contributions of developmental and evaluation research to prevention and intervention (pp. 71–88). Cambridge, MA: Hogrefe.
- Farrington, D. P., Ttofi, M. M., Crago, R. V., & Coid, J. W. (2014). Prevalence, frequency, onset, desistance, and criminal career duration in self-reports compared with official records. *Criminal Behaviour and Mental Health*, 24, 241–253.
- Farrington, D. P., Ttofi, M. M., Crago, R. V., & Coid, J. W. (2015). Intergenerational similarities in risk factors for offending. *Journal of Developmental and Life-Course Criminology*, 1, 48–62.

- Farrington, D. P., Ullrich, S., & Salekin, R. T. (2010). Environmental influences on child and adolescent psychopathy. In R. T. Salekin & D. R. Lynam (Eds.), Handbook of child and adolescent psychopathy (pp. 202–230). New York: Guilford Press.
- Farrington, D. P., & Welsh, B. C. (2003). Family-based prevention of offending: A meta-analysis. Australian and New Zealand Journal of Criminology, 36, 127–151.
- Farrington, D. P., & Welsh, B. C. (2007). Saving children from a life of crime. New York: Oxford University Press.
- Farrington, D. P., & West, D. J. (1993). Criminal, penal, and life histories of chronic offenders: Risk and protective factors and early identification. Criminal Behaviour and Mental Health, 3, 492–523.
- Fergusson, D. M., & Horwood, L. J. (1998). Exposure to interparental violence in childhood and psychosocial adjustment in young adulthood. *Child Abuse and Neglect*, 22, 339–357.
- First, M. B., Gibbon, M., Spitzer, R. L., Williams, J. B. W., & Benjamin, L. S. (1997). Structured Clinical Interview for DSM-IV Axis II Personality Disorders. Washington, DC: American Psychiatric Press.
- Fischer, D. G. (1984). Family size and delinquency. Perceptual and Motor Skills, 58, 527–534.
- Forouzan, E., & Nicholls, T. L. (2015). Childhood and adolescent characteristics of women with high versus low psychopathy scores: Examining developmental precursors to the malignant personality disorder. *Journal of Criminal Justice*, 43, 321–326.
- Forth, A. E., Brown, S. L., Hart, S. D., & Hare, R. D. (1996). The assessment of psychopathy in male and female noncriminals: Reliability and validity. *Personality and Individual Differences*, 20, 531–543.
- Forth, A. E., & Burke, H. C. (1998). Psychopathy in adolescence: Assessment, violence, and developmental precursors. In D. J. Cooke, A. E. Forth, & R. D. Hare (Eds.), Psychopathy: Theory, research, and implications for society (pp. 205–229). Dordrecht, The Netherlands: Kluwer Academic.
- Foster, H., & Brooks-Gunn, J. (2013). Neighborhood, family, and individual influences on school physical victimization. *Journal of Youth and Adolescence*, 42, 1596–1610.
- Fox, B. H., Jennings, W. G., & Farrington, D. P. (2015). Bringing psychopathy into developmental and lifecourse criminology theories and research. *Journal of Criminal Justice*, 43, 274–289.
- Freidenfelt, J., & af Klinteberg, B. (2003). Are negative social and psychological childhood characteristics of significant importance in the development of psychosocial functioning? *International Journal of Foren*sic Mental Health, 2, 181–193.
- Frick, P. J., Kimonis, E. R., Dandreaux, D. M., & Farrell, J. M. (2003). The four year stability of psychopathic traits in non-referred youth. *Behavioral Sciences and the Law*, 21, 713–736.
- Frodi, A., Dernevik, M., Sepa, A., Phillipson, J., & Bragesjö, M. (2001). Current attachment representation
of incarcerated offenders varying in degree of psychopathy. Attachment and Human Development, 3, 269–283.

- Gao, Y., Raine, A., Chan, F., Venables, P. H., & Mednick, S. A. (2010). Early maternal and paternal bonding, child physical abuse, and adult psychopathic personality. *Psychological Medicine*, 40, 1007–1016.
- Gottfredson, D. C. (2001). Schools and delinquency. Cambridge, UK: Cambridge University Press.
- Gottfredson, D. C., McNeil, R. J., & Gottfredson, G. D. (1991). Social area influences on delinquency: A multilevel analysis. *Journal of Research on Crime and Delinquency*, 28, 197–226.
- Graham, J. (1988). Schools, disruptive behaviour and delinguency. London: Her Majesty's Stationery Office.
- Graham, N., Kimonis, E. R., Wasserman, A. L., & Kline, S. M. (2012). Associations among childhood abuse and psychopathy facets in male sexual offenders. Personality Disorders: Theory, Research, and Treatment, 3, 66–75.
- Guay, J.-P., Ruscio, J., Knight, R. A., & Hare, R. D. (2007). A taxometric analysis of the latent structure of psychopathy: Evidence for dimensionality. *Journal* of Abnormal Psychology, 116, 701–716.
- Haapasalo, J., & Pokela, E. (1999). Child-rearing and child abuse antecedents of criminality. Aggression and Violent Behavior, 1, 107–127.
- Hahn, R. A., Bilukha, O., Lowy, J., Crosby, A., Fullilove, M. T., Liberman, A., et al. (2005). The effectiveness of therapeutic foster care for the prevention of violence. *Journal of Preventive Medicine*, 28, 72–90.
- Hare, R. D. (2003). Hare Psychopathy Checklist-Revised (PCL-R): 2nd Edition. Toronto: Multi-Health Systems.
- Hare, R. D., & Neumann, C. S. (2010). The role of antisociality in the psychopathy construct: Comment on Skeem and Cooke (2010). *Psychological Assessment*, 22, 446–454.
- Harris, G. T., Rice, M. E., & Lalumiere, M. (2001). Criminal violence: The roles of psychopathy, neurodevelopmental insults, and antisocial parenting. *Criminal Justice and Behavior*, 28, 402–426.
- Hart, S. D., Cox, D. N., & Hare, R. D. (1995). Hare PCL:SV. Hare Psychopathy Checklist: Screening Version. Toronto: Multi-Health Systems.
- Hart, S. D., & Hare, R. D. (1997). Psychopathy: Assessment and association with criminal conduct. In D. M. Stoff, J. Breiling, & J. D. Maser (Eds.), *Handbook of antisocial behavior* (pp. 22–35). New York: Wiley.
- Henggeler, S. W. (2011). Efficacy studies to large-scale transport: The development and validation of Multisystemic Therapy programs. Annual Review of Clinical Psychology, 7, 351–381.
- Henggeler, S. W., Melton, G. B., Smith, L. A., Schoenwald, S. K., & Hanley, J. H. (1993). Family preservation using multisystemic treatment: Long-term follow-up to a clinical trial with serious juvenile offenders. *Journal of Child and Family Studies*, 2, 283– 293.
- Henry, B., Caspi, A., Moffitt, T. E., & Silva, P. A. (1996).

Temperamental and familial predictors of violent and nonviolent criminal convictions: Age 3 to age 18. *Developmental Psychology*, 32, 614–623.

- Herrenkohl, T. I., Hawkins, J. D., Chung, I.-J., Hill, K. G., & Battin-Pearson, S. (2001). School and community risk factors and interventions. In R. Loeber & D. P. Farrington (Eds.), Child delinquents: Development, intervention, and service needs (pp. 211–246). Thousand Oaks, CA: SAGE.
- Ireland, T. O., & Smith, C. A. (2009). Living in partnerviolent families: Developmental links to antisocial behavior and relationship violence. *Journal of Youth* and Adolescence, 38, 323–339.
- Juby, H., & Farrington, D. P. (2001). Disentangling the link between disrupted families and delinquency. British Journal of Criminology, 41, 22–40.
- Kalb, L. M., Farrington, D. P., & Loeber, R. (2001). Leading longitudinal studies on delinquency, substance use, sexual behavior, and mental health problems with childhood samples. In R. Loeber & D. P. Farrington (Eds.), *Child delinquents: Development, intervention, and service needs* (pp. 415–423). Thousand Oaks, CA: SAGE.
- Kazdin, A. E., Siegel, T. C., & Bass, D. (1992). Cognitive problem-solving skills training and parent management training in the treatment of antisocial behavior in children. *Journal of Consulting and Clinical Psychology*, 60, 733–747.
- Kazemian, L., Widom, C. S., & Farrington, D. P. (2011). A prospective examination of the relationship between childhood neglect and juvenile delinquency in the Cambridge Study in Delinquent Development. *International Journal of Child, Youth, and Family Studies, 2, 65–82.*
- Kelley, M. L., Power, T. G., & Wimbush, D. D. (1992). Determinants of disciplinary practices in low-income black mothers. *Child Development*, 63, 573–582.
- Kitzman, H., Olds, D. L., Henderson, C. R., Hanks, C., Cole, R., Tatelbaum, R., et al. (1997). Effect of prenatal and infancy home visitation by nurses on pregnancy outcomes, childhood injuries, and repeated childbearing: A randomized controlled trial. *Journal* of the American Medical Association, 278, 644–652.
- Koivisto, H., & Haapasalo, J. (1996). Childhood maltreatment and adulthood psychopathy in light of filebased assessments among mental state examinees. *Studies on Crime and Crime Prevention*, 5, 91–104.
- Kolvin, I., Miller, F. J. W., Fleeting, M., & Kolvin, P. A. (1988). Social and parenting factors affecting criminal-offence rates: Findings from the Newcastle Thousand Family Study (1947–1980). British Journal of Psychiatry, 152, 80–90.
- Krischer, M. K., & Sevecke, K. (2008). Early traumatization and psychopathy in female and male juvenile offenders. *International Journal of Law and Psychiatry*, 31, 253–262.
- Krohn, M. D., Hall, G. P., & Lizotte, A. J. (2009). Family transition and later delinquency and drug use. *Jour*nal of Youth and Adolescence, 38, 466–480.

- Lang, S., af Klinteberg, B., & Alm, P.-O. (2002). Adult psychopathy and violent behavior in males with early neglect and abuse. *Acta Psychiatrica Scandinavica*, 106, 93–100.
- Larzelere, R. E., & Patterson, G. R. (1990). Parental management: Mediator of the effect of socioeconomic status on early delinquency. *Criminology*, 28, 301–324.
- Leistico, A.-M. R., Salekin, R. T., DeCoster, J., & Rogers, R. (2008). A large-scale meta-analysis relating the Hare measures of psychopathy to antisocial conduct. Law and Human Behavior, 32, 28–45.
- Leschied, A., Chiodo, D., Nowicki, E., & Rodger, S. (2008). Childhood predictors of adult criminality: A meta-analysis drawn from the prospective longitudinal literature. Canadian Journal of Criminology and Criminal Justice, 50, 435–467.
- Lipsey, M. W., & Derzon, J. H. (1998). Predictors of violent or serious delinquency in adolescence and early adulthood: A synthesis of longitudinal research. In R. Loeber & D. P. Farrington (Eds.), Serious and violent juvenile offenders: Risk factors and successful interventions (pp. 86–105). Thousand Oaks, CA: SAGE.
- Loeber, R., & Farrington, D. P. (1997). Strategies and yields of longitudinal studies on antisocial behavior. In D. M. Stoff, J. Breiling, & J. D. Maser (Eds.), *Handbook of antisocial behavior* (pp. 125–139). New York: Wiley.
- Loeber, R., Farrington, D. P., Stouthamer-Loeber, M., & van Kammen, W. B. (1998). Antisocial behavior and mental health problems. Mahwah, NJ: Erlbaum.
- Loeber, R., Farrington, D. P., Stouthamer-Loeber, M., & White, H. R. (2008). Violence and serious theft: Development and prediction from childhood to adulthood. New York: Routledge.
- Lösel, F., & Farrington, D. P. (2012). Direct protective and buffering protective factors in the development of youth violence. *American Journal of Preventive Medicine*, 43, S8–S23.
- Luntz, B. K., & Widom, C. S. (1994). Antisocial personality disorder in abused and neglected children. *American Journal of Psychiatry*, 151, 670–674.
- Lynam, D. R., Caspi, A., Moffitt, T. E., Loeber, R., & Stouthamer-Loeber, M. (2007). Longitudinal evidence that psychopathy scores in early adolescence predict adult psychopathy. *Journal of Abnormal Psycholology*, 116, 155–165.
- Lynam, D. R., Caspi, A., Moffitt, T. E., Raine, A., Loeber, R., & Stouthamer-Loeber, M. (2005). Adolescent psychopathy and the Big Five: Results from two samples. *Journal of Abnormal Child Psychology*, 33, 431–443.
- Lynam, D. R., Loeber, R., & Stouthamer-Loeber, M. (2008). The stability of psychopathy from adolescence into adulthood: The search for moderators. *Criminal Justice and Behavior*, 35, 228–243.
- Lytton, H. (1990). Child and parent effects on boys' conduct disorder: A reinterpretation. *Developmental Psychology*, 26, 683–697.

- Lytton, H., & Romney, D. M. (1991). Parents' differential socialization of boys and girls: A meta-analysis. Psychological Bulletin, 109, 267–296.
- MacDonald, G. M., & Turner, G. W. (2007). Treatment foster care for improving outcomes in children and young people. Campbell Systematic Reviews, Report No. 9.
- Malinosky-Rummell, R., & Hansen, D. J. (1993). Longterm consequences of childhood physical abuse. Psychological Bulletin, 114, 68–79.
- Manders, W. A., Dekovic, M., Asscher, J. J., van der Laan, P. H., & Prins, P. J. M. (2013). Psychopathy as predictor and moderator of multisystemic therapy outcomes among adolescents treated for antisocial behavior. *Journal of Abnormal Child Psychology*, 41, 1121–1132.
- Marcus, D. K., John, S. L., & Edens, J. F. (2004). A taxometric analysis of psychopathic personality. *Journal* of Abnormal Psychology, 113, 626–635.
- Marshall, L. A., & Cooke, D. J. (1999). The childhood experiences of psychopaths: A retrospective study of familial and social factors. *Journal of Personality Dis*orders, 13, 211–225.
- Maxfield, M. G., & Widom, C. S. (1996). The cycle of violence revisited six years later. Archives of Pediatrics and Adolescent Medicine, 150, 390–395.
- McCord, J. (1977). A comparative study of two generations of native Americans. In R. F. Meier (Ed.), *Theory in criminology* (pp. 83–92). Beverly Hills, CA: SAGE.
- McCord, J. (1979). Some child-rearing antecedents of criminal behavior in adult men. *Journal of Personality* and Social Psychology, 37, 1477–1486.
- McCord, J. (2001). Psychosocial contributions to psychopathy and violence. In A. Raine & J. Sanmartin (Eds.), Violence and psychopathy (pp. 141–169). New York: Kluwer Academic/Plenum Press.
- McCord, W., & McCord, J. (1964). The psychopath: An essay on the criminal mind. Princeton, NJ: van Nostrand.
- Moffitt, T. E., Caspi, A., Rutter, M., & Silva, P. A. (2001). Sex differences in antisocial behaviour. Cambridge, UK: Cambridge University Press.
- Morash, M., & Rucker, L. (1989). An exploratory study of the connection of mother's age at childbearing to her children's delinquency in four data sets. Crime and Delinquency, 35, 45–93.
- Muñoz, L. C., Kerr, M., & Besic, N. (2008). The peer relationships of youths with psychopathic personality traits: A matter of perspective. *Criminal Justice and Behavior*, 35, 212–227.
- Murray, J., Farrington, D. P., & Eisner, M. P. (2009). Drawing conclusions about causes from systematic reviews of risk factors: The Cambridge Quality Checklist. Journal of Experimental Criminology, 5, 1–23.
- Nagin, D. S., Pogarsky, G., & Farrington, D. P. (1997). Adolescent mothers and the criminal behavior of their children. *Law and Society Review*, 31, 137–162.

- Nelson, S. E., & Dishion, T. J. (2004). From boys to men: Predicting adult adaptation from middle childhood sociometric status. *Development and Psychopa*thology, 16, 441–459.
- Neumann, C., Wampler, M., Taylor, J., Blonigen, D. M., & Iacono, W. G. (2011). Stability and invariance of psychopathic traits from late adolescence to young adulthood. *Journal of Research in Personality*, 45, 145–152.
- Newson, J., & Newson, E. (1989). The extent of parental physical punishment in the UK. London: Approach.
- Odgers, C. L., Milne, B. J., Caspi, A., Crump, R., Poulton, R., & Moffitt, T. E. (2007). Predicting prognosis for the conduct disordered boy: Can family history help? *Journal of the American Academy of Child and Adolescent Psychiatry*, 46, 1240–1249.
- Olds, D. L., Eckenrode, J., Henderson, C. R., Kitzman, H., Powers, J., Cole, R., et al. (1997). Long-term effects of home visitation on maternal life course and child abuse and neglect: Fifteen-year follow-up of a randomized trial. *Journal of the American Medical Association*, 278, 637–643.
- Olds, D. L., Henderson, C. R., Chamberlin, R., & Tatelbaum, R. (1986). Preventing child abuse and neglect: A randomized trial of nurse home visitation. *Pediatrics*, 78, 65–78.
- Olds, D. L., Henderson, C. R., Cole, R., Eckenrode, J., Kitzman, H., Luckey, D., et al. (1998). Long-term effects of nurse home visitation on children's criminal and antisocial behavior: 15-year follow-up of a randomized controlled trial. *Journal of the American Medical Association*, 280, 1238–1244.
- Patrick, C. J., Zempolich, K. A., & Levenston, G. K. (1997). Emotionality and violent behavior in psychopaths: A biosocial analysis. In A. Raine, P. A. Brennan, D. P. Farrington, & S. A. Mednick (Eds.), *Biosocial bases of violence* (pp. 145–161). New York: Plenum Press.
- Patterson, G. R. (1982). Coercive family process. Eugene, OR: Castalia.
- Patterson, G. R. (1995). Coercion as a basis for early age of onset for arrest. In J. McCord (Ed.), Coercion and punishment in long-term perspectives (pp. 81–105). Cambridge, UK: Cambridge University Press.
- Piquero, A., Jennings, W. G., Diamond, B., Farrington, D. P., Tremblay, R. E., Walsh, B. C., et al. (2016). A meta-analysis update on the effects of early family/ parent training programs on antisocial behavior and delinquency. *Journal of Experimental Criminology*, 12, 229–248.
- Poythress, N. G., Skeem, J. L., & Lilienfeld, S. O. (2006). Associations among early abuse, dissociation, and psychopathy in an offender sample. *Journal of Abnor*mal Psychology, 115, 288–297.
- Rasanen, P., Hakko, H., Isohanni, M., Hodgins, S., Jarvelin, M., & Tilhonen, J. (1999). Maternal smoking during pregnancy and risk of criminal behavior among adult male offspring in the Northern Finland 1966 birth cohort. *American Journal of Psychiatry*, 156, 857–862.

- Reiss, A. J., & Farrington, D. P. (1991). Advancing knowledge about co-offending: Results from a prospective longitudinal survey of London males. *Jour*nal of Criminal Law and Criminology, 82, 360–395.
- Robins, L. N. (1966). Deviant children grown up. Baltimore: Williams & Wilkins.
- Robins, L. N. (1979). Sturdy childhood predictors of adult outcomes: Replications from longitudinal studies. In J. E. Barrett, R. M. Rose, & G. L. Klerman (Eds.), Stress and mental disorder (pp. 219–235). New York: Raven.
- Robins, L. N. (1992). The role of prevention experiments in discovering causes of children's antisocial behavior. In J. McCord & R. E. Tremblay (Eds.), *Preventing antisocial behavior* (pp. 3–18). New York: Guilford Press.
- Rothbaum, F., & Weisz, J. R. (1994). Parental caregiving and child externalizing behavior in nonclinical samples: A meta-analysis. *Psychological Bulletin*, 116, 55–74.
- Rutter, M. (1981). The city and the child. American Journal of Orthopsychiatry, 51, 610–625.
- Salekin, R. T. (2002). Psychopathy and therapeutic pessimism: Clinical lore or clinical reality? *Clinical Psychology Review*, 22, 79–112.
- Salekin, R. T., & Lochman, J. E. (2008). The search for protective factors. Criminal Justice and Behavior, 35, 159–172.
- Salekin, R. T., Worley, C., & Grimes, R. D. (2010). Treatment of psychopathy: A review and brief introduction to the mental model approach to psychopathy. *Behavioral Sciences and the Law*, 28, 235–266.
- Salihovic, S., Kerr, M., Özdemir, M., & Pakalniskene, V. (2012). Directions of effects between adolescent psychopathic traits and parental behavior. *Journal of Abnormal Child Psychology*, 40, 957–969.
- Salihovic, S., Özdemir, M., & Kerr, M. (2014). Trajectories of adolescent psychopathic traits. *Journal of Psychopathology and Behavioral Assessment*, 36, 47–59.
- Sampson, R. J., Raudenbush, S. W., & Earls, F. (1997). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science*, 277, 918–924.
- Sanders, M. R., Kirby, J. N., Tellegen, C. L., & Day, J. J. (2014). The Triple-P Positive Parenting program: A systematic review and meta-analysis of a multi-level system of parenting support. *Clinical Psychology Review*, 34, 337–357.
- Sanders, M., Markie-Dadds, C., Tully, L. A., & Bor, W. (2000). The Triple P-Positive parenting program: A comparison of enhanced, standard, and self-directed behavioral family intervention for parents of children with early onset conduct problems. *Journal of Consulting and Clinical Psychology*, 68, 624–640.
- Scott, S., Spender, Q., Doolan, M., Jacobs, B., & Aspland, H. (2001). Multicentre controlled trial of parenting groups for child antisocial behaviour in clinical practice. *British Medical Journal*, 323, 194–196.
- Scott, S., Sylva, K., Doolan, M., Price, J., Jacobs, B., Crook, C., & Landau, S. (2010). Randomised con-

trolled trial of parent groups for child antisocial behaviour targeting multiple risk factors: The SPOKES project. *Journal of Child Psychology and Psychiatry*, *51*, 48–57.

- Sexton, T. L., & Alexander, J. F. (2000). Functional family therapy. Washington, DC: U.S. Office of Juvenile Justice and Delinquency Prevention.
- Sexton, T., & Turner, C. W. (2010). The effectiveness of Functional Family Therapy for youth with behavioral problems in a community practice setting. *Journal of Family Psychology*, 24, 339–348.
- Shaw, C. R., & McKay, H. D. (1969). Juvenile delinquency and urban areas (rev. ed.). Chicago: University of Chicago Press.
- Shelton, K. K., Frick, P. J., & Wootton, J. (1996). The assessment of parenting practices in families of elementary school-aged children. *Journal of Clinical Child Psychology*, 25, 317–327.
- Skeem, J., & Cooke, D. J. (2010a). Is criminal behavior a central component of psychopathy?: Conceptual directions for solving the debate. *Psychological Assessment*, 22, 433–445.
- Skeem, J., & Cooke, D. (2010b). One measure does not a construct make: Directions toward reinvigorating psychopathy research—reply to Hare and Neumann (2010). Psychological Assessment, 22, 455–459.
- Smith, C. A., Krohn, M. D., Lizotte, A. J., McCluskey, C. P., Stouthamer-Loeber, M., & Weiher, A. (2000). The effect of early delinquency and substance use on precocious transitions to adulthood among adolescent males. In G. L. Fox & M. L. Benson (Eds.), *Families, crime and criminal justice* (Vol. 2, pp. 233–253). Amsterdam: JAI Press.
- Smith, C. A., & Stern, S. B. (1997). Delinquency and antisocial behavior: A review of family processes and intervention research. Social Service Review, 71, 382–420.
- Smith, J. R., & Brooks-Gunn, J. (1997). Correlates and consequences of harsh discipline for young children. Archives of Pediatrics and Adolescent Medicine, 151, 777–786.
- Stern, S. B., & Smith, C. A. (1995). Family processes and delinquency in an ecological context. Social Service Review, 69, 705–731.
- Thomas, R., & Zimmer-Gembeck, M. J. (2007). Behavioral outcomes of parent–child interaction therapy and Triple-P Positive Parenting program: A review and meta-analysis. *Journal of Abnormal Child Psychol*ogy, 35, 475–495.
- Thornberry, T. P., Freeman-Gallant, A., & Lovegrove, P. J. (2009). Intergenerational linkages in antisocial behaviour. Criminal Behaviour and Mental Health, 19, 80–93.

- Thornberry, T. P., Huizinga, D., & Loeber, R. (1995). The prevention of serious delinquency and violence: Implications from the program of research on the causes and correlates of delinquency. In J. C. Howell, B. Krisberg, J. D. Hawkins, & J. J. Wilson (Eds.), Sourcebook on serious, violent and chronic juvenile offenders (pp. 213–237). Thousand Oaks, CA: SAGE.
- Thornberry, T. P., Smith, C. A., Rivera, C., Huizinga, D., & Stouthamer-Loeber, M. (1999). Family disruption and delinquency. Washington, DC: Office of Juvenile Justice and Delinquency Prevention.
- Verona, E., Patrick, C. J., & Joiner, T. E. (2001). Psychopathy, antisocial personality, and suicide risk. *Journal of Abnormal Psychology*, 110, 462–470.
- Wasserman, G. A., & Miller, L. S. (1998). The prevention of serious and violent juvenile offending. In R. Loeber & D. P. Farrington (Eds.), Serious and violent juvenile offenders: Risk factors and successful interventions (pp. 197–247). Thousand Oaks, CA: SAGE.
- Webster-Stratton, C., & Hammond, M. (1997). Treating children with early-onset conduct problems: A comparison of child and parent training interventions. Journal of Consulting and Clinical Psychology, 65, 93–109.
- Webster-Stratton, C., Rinaldi, J., & Janila, M. R. (2011). Long-term outcomes of Incredible Years parenting program: Predictors of adolescent adjustment. *Child* and Adolescent Mental Health, 16, 38–46.
- Weiler, B. L., & Widom, C. S. (1996). Psychopathy and violent behaviour in abused and neglected young adults. *Criminal Behaviour and Mental Health*, 6, 253–271.
- Wells, L. E., & Rankin, J. H. (1991). Families and delinquency: A meta-analysis of the impact of broken homes. Social Problems, 38, 71–93.
- West, D. J., & Farrington, D. P. (1973). Who becomes delinquent? London: Heinemann.
- Widiger, T. (1998). Psychopathy and normal personality. In D. J. Cooke, A. E. Forth, & R. D. Hare (Eds.), Psychopathy: Theory, research, and implications for society (pp. 47–68). Dordrecht, The Netherlands: Kluwer Academic.
- Widom, C. S. (1989). The cycle of violence. Science, 244, 160–166.
- Widom, C. S. (1994). Childhood victimization and adolescent problem behaviors. In R. D. Ketterlinus & M. E. Lamb (Eds.), Adolescent problem behaviors (pp. 127–164). Hillsdale, NJ: Erlbaum.
- Widom, C. S., & Ames, M. A. (1994). Criminal consequences of childhood sexual victimization. Child Abuse and Neglect, 18, 303–318.
- Wikström, P.-O. H. (1985). Everyday violence in contemporary Sweden. Stockholm: National Council for Crime Prevention.

## CHAPTER 16

# The Neuroanatomical Bases of Psychopathy

A Review of Brain Imaging Findings

## YALING YANG ADRIAN RAINE

ore than a decade ago, brain imaging research on antisocial behavior was in its infancy. Today, a burgeoning body of neuroimaging evidence attests to the fact that links exist between brain deficits and antisocial, violent behavior. The majority of early published research in this area focused on the functioning of the brain using positron emission tomography (PET, which measures glucose metabolism), single-photon emission computerized tomography (SPECT, which assesses blood flow), and magnetic resonance spectroscopy (MRS, which assesses neural density). More recently, increasing research has shifted to the use of anatomical magnetic resonance imaging (aMRI, which indexes global/regional volumes, shape, or cortical thickness), diffusion tensor imaging (DTI, which indexes microstructural integrity of white-matter fiber tracts), and functional magnetic resonance imaging (fMRI, which measures blood flow during a task procedure or at rest).

Although a substantial neuroimaging literature now exists on antisocial behavior and aggression, comparatively fewer imaging studies have been conducted on the specific construct of psychopathy. As such, we consider in this chapter the larger database of brain imaging research on antisocial and violent behavior in relation to work that has been conducted to date on psychopathy. Although the emphasis of our review is on structural brain impairments in psychopathic individuals, functional imaging research is also discussed, as findings from such research may provide a more comprehensive understanding of the neurobiological mechanisms underlying psychopathy. Specific questions are posed even though complete answers cannot as yet be advanced—in particular, the following:

Which brain regions are implicated in violent, antisocial, and psychopathic behavior?

- Do different brain deficits predispose to different features of psychopathy?
- What role does the environment play?
- Do brain deficits actually cause psychopathy?
- More theoretically, how do they cause psychopathy?
- What causes the observed brain deficits?
- And can such deficits be treated or prevented?

## What Brain Areas Are Implicated?

Psychopathy is a complex clinical construct that most contemporary scholars view as including affective, interpersonal, and impulsive–antisocial symptoms. Given such complexity, it is somewhat expected that the neuroanatomical basis to psychopathy would not be simple, and that abnormalities in multiple key brain regions would show associations with psychopathy scores or groupings reflecting these diverse symptoms. Several reviews of brain imaging studies of violent, antisocial, and psychopathic populations have been undertaken (Blair, 2008; Davidson, Putnam, & Larson, 2000; Kiehl, 2006; Koenigs, 2012; Nordstrom et al., 2011; Patrick, 2014; Raine, 1993; Yang & Raine, 2009), the findings of which point to abnormalities in the prefrontal cortex, temporal cortex, amygdala-hippocampal complex, striatum, and the corpus callosum as perhaps most strongly associated with antisocial, psychopathic traits. The subsections that follow summarize findings for each of these brain regions from both structural and functional imaging studies of antisocial-aggressive and psychopathic individuals. Much of the published neuroimaging research has utilized Hare's (2003) Psychopathy Checklist—Revised (PCL-R) or one of its variants (for a review, see Hare, Neumann, & Mokros, Chapter 3, this volume) to assess for psychopathic tendencies; unless otherwise specified, psychopathy-related findings reviewed in sections that follow are from studies utilizing Psychopathy Checklist (PCL)-based measures. References to antisocial personality disorder (ASPD) reflect the diagnosis as defined in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association [APA], 2013).

## Prefrontal Cortex

The historical starting point for suspecting structural impairments in the prefrontal cortex as predisposing an individual toward psychopathic tendencies is the case study of Phineas Gage, a foreman working for the Great Western Railways in 1848, who had a tamping rod blown through his face and forehead. An MRI reconstruction of the resulting damage indicated that the trajectory of the rod selectively damaged the prefrontal cortex, in particular, the ventromedial region, including the orbitofrontal cortex (Damasio, Grabowski, Frank, Galaburda, & Damasio, 1994). The accident transformed Gage from a reliable, well-liked, respected, and organized individual into a man who was garrulous, sexually promiscuous, reckless, unreliable, and irresponsible-essentially a pseudopsychopathic individual (Damasio, 1994). While only a single case study, this example nevertheless sets up the hypothesis that damage (or even functional impairment) within the prefrontal cortex may predispose an individual to psychopathic behavior. However, the key question remains of whether this hypothesis is supported or not by brain imaging studies of antisocial and psychopathic populations.

## Antisocial/Violent Behavior: Functional Imaging

Early brain imaging studies using PET, SPECT, and MRS indicated initial evidence of frontal abnormality in antisocial populations. For example, using PET, reduced glucose metabolism in the frontal cortex was found in relation to impulsive-aggressive and violent behavior in psychiatric patients (Goyer, Andreason, Semple, & Clayton, 1994; Volkow et al., 1995) and individuals convicted of murder (Raine, Buchsbaum, & LaCasse, 1997; Raine, Buchsbaum, et al., 1994). Using SPECT, researchers observed reduced regional cerebral blood flow (rCBF) in frontal brain regions in alcoholics with ASPD and patients with impulsivity-related personality disorders, including ASPD (Goethals et al., 2005; Kuruoglu et al., 1996). Using MRS, Critchley and colleagues (2000) found lower prefrontal concentrations of N-acetyl aspartate (NAA) and creatine phosphocreatine, indicating reduced neural density within these regions, in repetitively violent offenders with mild mental retardation compared to controls.

More recently, studies have employed fMRI to investigate frontal dysfunction in antisocial individuals. For example, using a nonverbal Stroop task, Schiffer and colleagues (2014) found reduced response time interference and a different pattern of conflict- and error-related activity in the anterior cingulate, dorsolateral prefrontal cortex, superior temporal cortex, putamen, and amygdala in 21 violent offenders with ASPD compared to 23 nonoffenders-and these between-group differences were correlated with core features of psychopathy. Another fMRI study involving 32 offenders with ASPD indicated that activations in the bilateral dorsolateral prefrontal cortex, middle frontal gyrus, and the bilateral anterior cingulate gyrus/medial superior frontal gyrus during deception were correlated with the capacity to lie (Jiang et al., 2013). A subsequent study by this same research group using resting-state fMRI further revealed reduced amplitude of low-frequency fluctuation in the right orbitofrontal cortex, as well as the left temporal pole, the right inferior temporal gyrus, and the left cerebellum, among individuals in this ASPD offender sample (Liu, Liao, Jiang, & Wang, 2014).

#### Psychopathy: Functional Imaging

Along with the growing literature on general offender samples, there are now several studies showing frontal dysfunction in high-psychopathy offenders. In an early study, drug-abusing offenders high in psychopathy, compared to those low in psychopathy and nonoffender controls, showed increased rCBF bilaterally in frontotemporal regions during the processing of negative affective words (Intrator et al., 1997). Similarly, in an fMRI study utilizing an affective memory task, psychopathic offenders showed overactivation of frontotemporal regions when performing the task (Kiehl et al., 2001)-although they also showed decreased activation in subcortical regions during the task. Furthermore, psychopathic offenders have shown increased activation in response to negative emotional pictures in the right inferior and medial prefrontal cortex, but decreased activation in response to positive emotional pictures in the right medial prefrontal cortex along with increased left orbitofrontal activation (Müller et al., 2003). On the other hand, in a more recent fMRI study using a passive avoidance task, Finger and colleagues (2011) reported that youth exhibiting disruptive behavior disorders and scoring high on psychopathic traits showed less orbitofrontal responsiveness to early stimulus-reinforcement exposure, as well as to rewards, and less caudate response to early stimulus-reinforcement exposure. In another study using a fear-conditioning task, delinquents with higher overall scores on a self-report measure of psychopathy (Andershed, Kerr, Stattin, & Levander, 2002) were also found to show less activation in fear-processing-related brain areas, including the anterior cingulate cortex, insula, and amygdala (Cohn et al., 2013). Furthermore, regression analyses revealed contrasting associations for differing symptom components of psychopathy: callous-unemotional (CU) traits in particular were related to reduced activation in these regions, whereas impulsive-irresponsible and grandiosemanipulative traits were associated with relatively greater activation.

Taken together, findings from studies to date indicate task-specific frontal dysfunction in psychopathic individuals, with potentially greater frontal activation required for affect-related tasks (potentially to compensate for emotional deficits) and less frontal activation for reward-related task (potentially as a function of elevated reward-dominant behavior).

#### Structural Impairments in Antisocial, Psychopathic Individuals

An increasing number of studies over the past decade have addressed whether prefrontal structural impairments characterize antisocial and psychopathic personality. The first aMRI brain imaging study of antisocial behavior involved a sample of 21 community adults with ASPD who also had high psychopathy scores. This sample of antisocial psychopathic individuals showed an 11% reduction in the volume of gray matter in the prefrontal cortex compared with both normal controls and a substance dependence control group (Raine, Lencz, Bihrle, LaCasse, & Colletti, 2000). In subsequent studies, Yang, Raine, Colletti, Toga, and Narr (2010; Yang et al., 2005b) found volume reductions in the orbitofrontal cortex and gyrus rectus in a group of individuals with high psychopathy, particularly those with prior criminal convictions, compared to healthy controls. Consistent with these findings, Laakso and colleagues (2002) found reduced left dorsolateral prefrontal, orbitofrontal, and medial frontal volumes in alcoholics with antisocial personalities compared to controls. Similarly, Woermann and colleagues (2000) found reduced left prefrontal gray volumes in aggressive patients with epilepsy. More recently, Gregory and colleagues (2012) showed that persistent violent offenders with both ASPD and psychopathy showed reduced gray-matter volume in the anterior rostral prefrontal cortex compared to offenders with ASPD only and nonoffenders. This recent evidence further indicates that psychopathy represents a distinct phenotype with unique neuropathological underpinnings.

In addition to volumetric abnormalities, recent studies have also revealed abnormal cortical thickness in the frontal cortex in antisocial, psychopathic individuals. For example, Yang, Raine, Colletti, Toga, and Narr (2009, 2010) reported abnormal thinning in several frontal and temporal regions, including the right middle frontal and ventromedial prefrontal cortex in psychopathic individuals. In addition, reduced cortical thickness in the orbitofrontal cortex was linked to increased response perseveration in psychopathic individuals (Yang, Raine, Colletti, Toga, & Narr, 2011). Furthermore, studies assessing network connectivity have characterized abnormal or distinctive connectivity patterns in the frontal cortex in antisocial, psychopathic individuals. For example, using a graph theory approach to quantify information flow and connectivity among frontal subregions based on cortical thickness measures, Yang, Raine, Joshi, and colleagues (2012) reported evidence of altered interregional connectivity patterns in high- versus low-psychopathy participants from the general community. In addition, a more recent study found that reduced frontal volumes overlapped with areas showing increased degrees of functional connectivity at the dorsomedial frontal cortex in high-psychopathy participants (Contreras-Rodriguez et al., 2015). Using seed-based connectivity mapping, these investigators also demonstrated a pattern of reduced functional connectivity of prefrontal areas with limbic-paralimbic structures and enhanced connectivity within the dorsal frontal lobes in subjects with psychopathy. In line with these findings, using both aMRI and resting-state fMRI, Ly and colleagues (2012) found thinner cortex in right inferior frontal, anterior temporal, and anterior cingulate regions that related in turn to reductions in functional connectivity between the left insula and left dorsal anterior cingulate cortex in psychopathic criminal offenders compared to nonpsychopathic offenders.

### **Temporal Cortex**

#### Antisocial and Violent Behavior

Relatively poor cortical functioning in the temporal lobe is another finding that has emerged from the early brain imaging literature on antisocial behavior. Reduced glucose metabolism was reported in medial temporal regions of violent patients (Volkow et al., 1995), and in two other studies, temporal lobe abnormalities were found to be more prevalent in aggressive versus nonaggressive psychiatric patients (Amen, Stubblefield, Carmichael, & Thisted, 1996; Wong et al., 1997). Aggressive patients with dementia were also found to show reduced blood flow in the left anterior temporal lobe as measured by SPECT (Hirono, Mega, Dinov, Mishkin, & Cummings, 2000).

It should be noted that many of the reported temporal lobe functional abnormalities in aggressive populations may reflect frontotemporal dysfunction, as evidenced by the fact that most of the aforementioned studies found coexisting frontal deficits. For example, using resting-state fMRI, one recent study found regional homogeneity to be *higher* in the left inferior temporal gyrus and *lower* in the right middle frontal gyrus in individuals with ASPD (Tang et al., 2013). A second notable point is that different imaging technologies using different activation states may be sensitive to dysfunction in different brain regions. For example, one study found resting electroencephalographic (EEG) abnormalities in the temporal lobes of murderers, even though PET activation testing did not reveal evidence for temporal lobe dysfunction (Gatzke-Kopp, Raine, Buchsbaum, & LaCasse, 2001). In terms of structure, reduced temporal volume has been found in patients with impulsive– aggressive traits and personality disorders (Dolan, Deakin, Roberts, & Anderson, 2002).

#### Psychopathy

As discussed previously, using SPECT, Intrator and colleagues (1997) found that psychopathic offenders showed increased bilateral blood flow in frontotemporal regions during the processing of emotional words. In another study, using SPECT, Soderstrom and colleagues (2002) observed no significant correlations between left or right temporal lobe blood flow at rest and total psychopathy scores in a group of violent offenders. However, Müller and colleagues (2003) reported reduced (rather than increased) activation in the right temporal gyrus in high-psychopathy offenders in response to negative affect stimuli. Consequently, unlike broad-based antisocial personality, psychopathy in particular may not be associated with aberrant temporal lobe functioning.

#### Amygdala and Hippocampus

Functional impairments in the hippocampus and amygdala have been observed in antisocial individuals and violent offenders. For example, abnormal asymmetries of functioning were found in an early PET study of individuals convicted of murder, who showed lower left and increased right functioning in both the amygdala and hippocampus compared to controls (Raine et al., 1997). In a subsequent SPECT study, Soderstrom, Tullberg, Wikkelso, Ekholm, and Forsman (2000) found reduced hippocampal functioning bilaterally in violent offenders. In another study of repetitively violent patients, Critchley and colleagues (2000) reported reduced concentration of NAA in the amygdala-hippocampal complex, which in turn (as noted earlier) indicates reduced neural density. Elsewhere, Kumari and colleagues (2009) found that higher impulsivity scores in a group of violent patients with schizophrenia were associated with reduced hippocampus and orbitofrontal cortex volume. With respect to the amygdala, however, one early study by van Elst, Woermann, Lemieux, Thompson, and Trimble (2000) showed that aggressive and nonaggressive epileptic patients did not differ in amygdala volume or amygdala pathology as measured by MRI.

#### Psychopathy

Several studies have revealed abnormal function and structure in the amygdala-hippocampal complex in psychopathic individuals. For example, during an aversive conditioning procedure, highpsychopathy inpatients with ASPD showed atypically increased activation in the amygdala (Schneider et al., 2000). By contrast, using fMRI, Kiehl and colleagues (2001) found reduced activation in the amygdala-hippocampal complex in highpsychopathy offenders when processing affective stimuli. Relatedly, Müller and colleagues (2003) observed reduced activation in the left parahippocampal gyrus in psychopathic offenders in response to negative emotional stimuli. Consistent with this, Birbaumer and colleagues (2005) reported a lack of differential activity in the limbicfrontal circuit, including the amygdala and orbitofrontal cortex, during the acquisition phase of a fear conditioning task in high-psychopathy adults compared to normal controls. More recently, in a study of relatively healthy adults (Marsh & Cardinale, 2014), increased psychopathic traits, as indexed by the self-report-based Psychopathic Personality Inventory-Revised (PPI-R; Lilienfeld & Widows, 2005) were associated with reduced activity in the right amygdala during judgments of fearevoking statements. In another study of healthy adult participants that examined brain activity during decisions about whether to inflict costly punishment on co-participants who proposed unfair offers, psychopathic traits as indexed by Levenson, Kiehl, and Fitzpatrick's (1995) Self-Report Psychopathy Scale, were associated with less amygdala activity in response to the unfairness of offers (Osumi et al., 2012). Moreover, the reduced amygdala response among psychopathic individuals in this study was associated with reduced functional connectivity between the amygdala and dopaminergic-related areas, including the striatum, when punishment was available compared to when it was unavailable.

Another study that used adults from the community selected to be either high or low in CU traits as indexed by the Coldheartedness scale of the PPI-R found significantly reduced amygdala and medial prefrontal cortex activity for the high group in relation to fearful faces with occluded eyes, but not in relation to fearful eyes presented in isolation (Han, Alders, Greening, Neufeld, & Mitchell, 2012). In line with these findings, another recent study reported that the presence of psychopathy-related differences in amygdala activation was dependent upon goal-directed attention (Larson et al., 2013). Specifically, reduced activity in the amygdala was evident in PCL-R high-scoring offenders only when attention was engaged in an alternative goal-relevant task prior to the appearance of threat-relevant information, and this reduced amygdala activation was found to be mediated by increased lateral prefrontal activation.

With regard to brain structure, one early aMRI study found reductions in the volume of the posterior hippocampus to be associated with increased psychopathy scores in antisocial alcoholics (Laakso et al., 2001). Consistent with these findings, Cope and colleagues (2012) found psychopathic traits to correlate negatively with gray-matter volumes in the right hippocampus and right insula, but positively with gray-matter volumes in bilateral orbitofrontal cortex and right anterior cingulate cortex in a group of substance users. Exploratory regression analyses further revealed that gray-matter volumes within the right hippocampus and left orbitofrontal cortex combined explained about 22% of the variance in psychopathy scores. On the other hand, a somewhat earlier study by Boccardi and colleagues (2010) found both reduced shape along the dorsal and ventral hippocampal surface and abnormal enlargement of the lateral borders in psychopathic individuals. In another study preceding this, Raine and colleagues (2004) found, instead of volume differences, exaggerated anterior hippocampal asymmetry (right larger than left) in apprehended violent offenders with psychopathy compared to both unapprehended (successful) psychopaths and controls. Furthermore, Ermer, Cope, Hyalakanti, Calhoun, and Kiehl (2012), in more recent work using a whole-brain analytic approach with data from a sample of nearly 300 incarcerated criminal offenders, found reduced regional gray-matter volume bilaterally in the parahippocampal gyrus, amygdala, hippocampus, and orbitofrontal cortex.

Regarding the amygdala, one early study reported reduced amygdala volume to be associated with increased psychopathy scores within a sample of violent offenders (Tiihonen et al., 2000). However, the violent nature of the sample as a whole complicated interpretation of findings from this work. In the first study to link amygdala abnormalities specifically to psychopathy, Yang, Raine, Narr, Colletti, and Toga (2009) reported significant bilateral volume reductions and shape deformations in the amygdala, particularly in the basolateral and central subnuclei, in high psychopathy adults from the community compared to controls. In a follow-up report, Yang and colleagues (2010) further showed that the amygdala deformations were more severe in high-psychopathy individuals with criminal convictions (unsuccessful) compared to those without convictions (successful psychopaths). Along similar lines, Boccardi and colleagues (2011) found reduced volume of the basolateral amygdala nuclei in psychopathic criminal offenders with substance abuse compared

to controls. However, they also found that central and lateral amygdala nuclei were *enlarged* in psychopathic offenders compared to controls. Several factors may have contributed to the different findings across these studies, including heterogeneous sample characteristics, various degrees of psychopathy, and comorbid disorders. Nevertheless, in a recent report of findings from a longitudinal study, Pardini, Raine, Erickson, and Loeber (2014) found reduced amygdala volume to be associated with higher levels of psychopathic traits as indexed by Paulhus and colleagues' (2014) Self-Report Psychopathy Scale in a group of men with varying histories of violence, even after controlling for earlier levels of psychopathic features.

In summary, despite some inconsistencies, the majority of published findings to date support a possible link between abnormalities in the amygdala–hippocampus complex and psychopathy.

#### Striatum

More recently, emerging evidence indicates abnormalities in regions densely connected with frontal, temporal, and limbic structures, particularly the striatum, being associated with antisocial behavior and psychopathic traits (Blair, 2013; Glenn & Yang, 2012). For example, Barkataki, Kumari, Das, Taylor, and Sharma (2006) reported increased volume in the putamen in antisocial individuals compared to healthy controls. Another study by Schiffer and colleagues (2011) found that violent offenders had larger volumes in the nucleus accumbens and the caudate head than nonoffenders, and that volumes in these regions were positively correlated with all core features of psychopathy. Consistent with these findings, Glenn, Raine, Yaralian, and Yang (2009) found a 9.6% increase in the volume of the total striatum (including the caudate, putamen, and globus pallidus) in psychopathic individuals compared to a control group matched for history of substance use. However, conflicting findings also exist. For example, in one study, Boccardi and colleagues (2013) found the volume of the nucleus accumbens to be 13% smaller in offenders with high psychopathy scores. These investigators also reported that caudate and putamen local morphology correlated negatively with lifestyle features of psychopathy.

Some initial evidence from fMRI studies dovetails with structural imaging findings in suggesting striatal dysfunction in antisocial, psychopathic individuals. For example, Vollm and colleagues (2006) found that antisocial individuals showed less differential activity in the caudate during rewarded versus nonrewarded trials of a simple response task compared to normal controls. In another study involving child participants, Gatzke-Kopp and colleagues (2009) found that children with externalizing disorders showed elevated activity in the caudate during both rewarding and nonrewarding trials of a response task, in contrast with normal controls, who exhibited increased caudate activation during rewarding trials only. In a study of adult male prison inmates, Pujara, Motzkin, Newman, Kiehl, and Koenigs (2014) found a significant positive association between psychopathy severity and neural activity in the ventral striatum during a gambling task designed to index sensitivity to reward and loss outcomes. Also consistent with the idea of striatal dysfunction are findings from a study by Finger and colleagues (2008), in which children with psychopathic traits failed to show appropriate response reversal following changes in reinforcement contingency within a reversal learning task. In conjunction with this behavioral deficit, children with psychopathic traits showed increased activity in the caudate in response to punished errors, whereas healthy children showed decreased activity. As described previously, Kiehl and colleagues (2001) found reduced activity in the ventral striatum in response to negatively valenced stimuli in psychopathic offenders during an affective memory task. These investigators argued that this finding could reflect deviant response perseveration on the part of psychopathic individuals, in which they continue to find previously rewarded responses to be rewarding even after the feedback has changed from reinforcement to punishment.

#### **Corpus Callosum**

#### Antisocial/Violent Behavior

Although damage to the corpus callosum has long been hypothesized to constitute a neurological predisposition to violence, very few neuroimaging studies to date have tested this hypothesis. In an early study using PET, Raine and colleagues (1997) found that individuals convicted of murder exhibited decreased metabolic activity in the corpus callosum compared to normal controls. In a more recent study using DTI, Sundram and colleagues (2012) found reduced fractional anisotropy (FA) and increased mean diffusivity (MD) in the corpus collosum, uncinate faciculus, inferior occipitofrontal fasciculus, and anterior corona radiata in adults with ASPD. Although sparse, results suggesting callosal abnormalities are in line with findings of impaired interhemispheric transfer time in antisocial/psychopathic offenders (Hiatt & Newman, 2007).

## Psychopathy

There appear to be only two studies focusing on the corpus callosum in individuals assessed specifically for psychopathy. In the first of these, Raine, Lencz, and colleagues (2003) compared 15 male subjects with both high psychopathy scores and ASPD, and 25 matched controls from a larger sample of 83 community volunteers, on aMRI measures of the corpus callosum, electrodermal and cardiovascular activity during a social stressor, and personality measures of affective and interpersonal deficits. Compared with controls, psychopathic antisocial individuals showed a 22.6% increase in estimated callosal white-matter volume, a 6.9% increase in callosal length, a 15.3% reduction in callosal thickness, and increased functional interhemispheric connectivity. Correlational analyses in the larger unselected sample of 83 subjects confirmed the association between psychopathic personality and callosal structural abnormalities. Larger callosal volumes were associated with affective and interpersonal deficits, low autonomic stress reactivity, and low spatial ability. More recently, using DTI, Craig and colleagues (2009) found reduced FA in the uncinate fasciculus, which links the orbitofrontal cortex to the amygdala, in high-psychopathy forensic inpatients compared with age- and IQ-matched controls, with supplemental analyses showing that findings could not be accounted for by previous substance use or institutionalization.

# Are Different Brain Deficits Associated with Different Forms of Psychopathy?

## Impulsive versus Predatory Aggression

Sufficient evidence has now accumulated in support of brain abnormalities in aggressive individuals. However, initial evidence suggests that there may be different brain bases to impulsive or affective violence as compared to predatory or planned violence (Bukowski, Schwartzman, Santo, Bagwell, & Adams, 2009; Davidson et al., 2000; Lopez-Duran, Olson, Hajal, Felt, & Vazquez, 2009; Raine, Reynolds, Venables, Mednick, & Farrington, 1998). Specifically, frontal abnormalities may be more pronounced in individuals engaging in impulsive rather than premeditated aggression. One early study found prefrontal dysfunction to be specific to affective, impulsive murderers as opposed to predatory, instrumental murderers, whereas increased subcortical activity was common to both impulsive and planned murders (Raine, Phil, Stoddard, Bihrle, & Buchsbaum, 1998). This pattern of results suggests that whereas individuals who commit predatory, controlled murders may have sufficient prefrontal regulation to moderate excess aggressive feelings generated subcortically, this inhibitory control may be lacking in affective, impulsive murderers. Converging with these results are data from two other studies, one showing reduced glucose metabolism in the frontal cortex to be associated with frequency of impulsive aggression in patients with personality disorders (Goyer et al., 1994; Raine, Meloy, et al., 1998), and the other showing reduced temporofrontal rCBF in impulsively violent offenders (Soderstrom et al., 2000). Also consistent with these lines of evidence is the finding of differential hypothalamic-pituitary-adrenal (HPA) axis stress reactivity observed between proactive and reactive aggression (Lopez-Duran et al., 2009).

In contrast to impulsive, affectively violent offenders, psychopathic offenders (who are more likely to commit predatory violence than nonpsychopathic criminals) appear to show either normal or *increased* patterns of neural activation compared to nonpsychopathic offenders and controls, particularly in frontal brain regions. Adults with psychopathy have been found to exhibit increased bilateral rCBF in temporofrontal regions during the processing of emotional words (Intrator et al., 1997), increased activation in the dorsolateral prefrontal cortex during an aversive conditioning paradigm (Schneider et al., 2000), and overactivation of temporofrontal regions during affective memory processing (Kiehl et al., 2001). Similarly, predatory murderers (who may resemble psychopaths more than do impulsive murderers) show ostensibly normal prefrontal activation (Raine, Meloy, et al., 1998), again suggesting relatively greater brain activation to be associated with proactive aggression. This perspective is further supported by findings from another study of female adolescents with conduct disorder, which showed impulsive-reactive aggressive symptoms to be negatively correlated with right dorsolateral gray-matter volume, whereas CU traits were positively correlated with bilateral orbitofrontal volume (Fairchild et al., 2013). Future studies assessing subgroups of psychopathic individuals (i.e., predatory-planned vs. impulsive-psychopathic subgroups) are needed to address this issue more precisely in the psychopathy domain.

#### Lying, Conning, and Manipulation

Several fMRI studies have yielded informative clues regarding the brain mechanisms that subserve lying in normal individuals. For example, in one early study using a computer-based interrogation procedure, lying was found to be associated both with increased response time and greater activation in bilateral ventrolateral prefrontal cortices (Spence et al., 2001). In another study of healthy adults, efforts to feign memory impairments during a forced-choice task were linked to increased activation in a prefrontal-parietal-subcortical circuit (Lee et al., 2002). In another study examining lies of two different types (well-rehearsed vs. spontaneous lies), researchers found that lies of both types were associated with increased bilateral activation in the anterior prefrontal cortex, bilateral parahippocampal gyrus, right precuneus, and left cerebellum (Ganis, Kosslyn, Stose, Thompson, & Yurgelun-Todd, 2003). Common to all of these studies is increased activation in the prefrontal cortex during lying, particularly regions involved in response conflict and inhibitory control, such as the dorsolateral prefrontal cortex, ventrolateral prefrontal cortex, and the anterior cingulate cortex (Marchewka et al., 2012).

While these fMRI studies have indicated increased bilateral activation in the prefrontal cortex when normal subjects lie, there has been little work to date testing for structural brain abnormalities in deceitful, manipulative, conning individuals. One study by our group sought to address this issue (Yang et al., 2005a). Prefrontal gray- and white-matter volumes were assessed using structural magnetic resonance imaging (sMRI) data collected from 12 pathological liars, 16 antisocial controls, and 21 normal controls. Group comparisons revealed that liars showed a 22-26% increase in prefrontal white matter and a 36-42% reduction in prefrontal grav-white ratios compared to both antisocial controls and normal controls. In a subsequent study, Yang and colleagues (2007) localized the white-matter increase in liars to the orbitofrontal, middle, and inferior frontal gyri. Findings from this work provide the first evidence of a structural brain deficit in liars, and indicate that excessive prefrontal white matter relative to gray matter may predispose individuals to display these specific features of psychopathy.

Corroborative support for this possibility is provided by fMRI studies of deception among antisocial, psychopathic individuals. For example, Jiang and colleagues (2013) found neural activations in the middle frontal, superior frontal, and anterior cingulate cortex during lying versus truthtelling to be associated with the capacity for deception in adult offenders with ASPD. In a study by Fullam, McKie, and Dolan (2009), increased activation in the ventrolateral prefrontal cortex during deception was correlated with psychopathic traits such as coldheartedness and fearlessness (assessed via self-report) in adults.

In summary, available findings suggest that brain abnormalities, specifically in frontal regions as mentioned earlier, may be specific to the lying, manipulative, and conning characteristics of psychopathy.

#### Factors of Psychopathy

Of all brain imaging studies of psychopathic individuals, only a small number have examined effects in relation to symptom subdimensions (factors) of psychopathy. An early study by Laakso and colleagues (2000), using aMRI, found no significant correlations between total, Factor 1, or Factor 2 scores on the PCL-R and either prefrontal gray- or white-matter volume. On the other hand, this null effect could be due to a restriction of range, as the sample was limited to violent offenders who had a diagnosis of ASPD and were also alcoholic. In contrast to these null findings, Yang and colleagues (2005b), using aMRI in a community sample with a wide range of PCL-R psychopathy scores, found significant negative correlations between prefrontal gray-matter volume and scores for the PCL-R as a whole and both its factors. In addition, similar correlations were observed between prefrontal gray-matter volume and the three factors of psychopathy delineated by Cooke and Michie (2001): arrogant and deceitful interpersonal style, deficient affective experience, and impulsive-irresponsible behavioral style. The size of the correlations was similar across the psychopathy factors, indicating that reduced prefrontal gray matter was a common denominator to all features of psychopathy.

In a more recent study, Yang, Raine, Narr, and colleagues (2009) showed that associations between reduced amygdala volumes and increased psychopathy scores were most prominent for the affective and interpersonal facets of psychopathy. Similarly, using a group of community psychiatric patients with high psychopathy scores, de Oliveira-Souza and colleagues (2008) found reduced graymatter volumes in the frontopolar, orbitofrontal, anterior and superior temporal, and insula regions to be associated specifically with the interpersonal–affective (Factor 1) dimension of psychopathy.

Some recent work suggests that reported associations between increased striatum and psychopathy may also be attributable to particular subdimensions. For example, Glenn and colleagues (2009) found that increased volume in the caudate head was associated with impulsive-antisocial ("lifestyle") features of psychopathy, whereas increased volume in the caudate body was primarily associated with interpersonal-affective features. By contrast, increased lenticular nucleus (putamen and globus pallidus) volume was associated with all features except the interpersonal features. These findings are further supported by evidence from studies of children with CU traits (Herpers, Scheepers, Bons, Buitelaar, & Rommelse, 2014). For example, within a group of female adolescents diagnosed with conduct disorder, Fairchild and colleagues (2013) reported that aggressive symptoms were negatively correlated with right dorsolateral prefrontal cortex volume, whereas CU traits were positively correlated with bilateral orbitofrontal cortex volume.

Overall, findings from the small body of work that has examined associations for psychopathy subdimensions suggest potentially unique neuropathological contributions to distinct symptomatic components of psychopathy that require further investigation.

## Successful versus Unsuccessful Psychopaths

Another concept that has received increasing attention in the literature is the distinction between "successful" and "unsuccessful" psychopathic individuals (Benning, Venables, & Hall, Chapter 24, this volume). One early study indicated that unsuccessful psychopaths (defined as those with histories of criminal apprehension) show reduced autonomic stress reactivity and executive function deficits compared to controls (Ishikawa, Raine Lencz, Bihrle, & LaCasse, 2001), whereas successful (never apprehended) psychopaths showed heightened autonomic stress reactivity and performed better at the Wisconsin Card Sorting Test than unsuccessful psychopaths and controls. Because both autonomic and executive functional deficits result from structural damage to the prefrontal cortex (Bechara, Damasio, Tranel, & Damasio, 1997; Damasio, 1994), these initial studies encourage the prediction that unsuccessful, but not successful, psychopaths will show brain impairments.

The prediction is largely supported by brain imaging evidence to date. For example, one early study showed that high-psychopathy participants had an exaggerated structural anterior hippocampal asymmetry (right > left), but this feature was evident only in unsuccessful (previously apprehended) psychopaths, not successful (never apprehended) psychopaths, compared to controls (Raine et al., 2004). Similarly, a study by Yang and colleagues (2005b) revealed that volume reduction in the prefrontal cortex only presents in unsuccessful psychopaths, not successful psychopaths. In a subsequent study, Yang and colleagues (2010) found that reduced cortical thickness in the middle frontal and orbitofrontal cortex and reduced volume and surface shape in the amygdala were also more prominent in unsuccessful psychopaths compared to their successful counterparts. Findings may reflect a differential underlying neurodevelopmental abnormality between these two subgroups, with more prominent brain deficits in unsuccessful psychopaths perhaps rendering them more prone to criminal conviction.

## The Role of the Environment: A Biosocial Perspective

One of the limitations of existing brain imaging research on psychopathic and antisocial/violent offenders is that very few studies to date have addressed the role of psychosocial risk and protective factors for violence. Nevertheless, the few studies that have addressed this issue are beginning to yield knowledge regarding two related but distinguishable issues. The first concerns whether home background moderates the relationship between violence and brain functioning. The second concerns whether brain deficits combine with psychosocial deficits to predispose individuals to violence.

Regarding the first issue, two studies to date have demonstrated a moderating effect of home background on brain dysfunction associated with violent behavior, but in opposing directions. In one PET study, deficits in frontal brain function (as indexed by regional glucose uptake during performance of a task) were found to be particularly pronounced in violent individuals who had not been exposed to significant social stressors. Murderers from nondeprived home backgrounds showed a 14.2% reduction in functioning of the right orbitofrontal cortex relative to murderers from deprived home backgrounds characterized by abuse, neglect, and marital violence (Raine, Phil, et al., 1998). It was argued that neurobiological deficits are more pronounced among violent individuals who lack the psychosocial deprivation that normally provides a "social push" toward violence. In contrast, a more recent fMRI study showed that violent offenders who had been severely abused as children were more likely to exhibit poor temporal lobe functioning compared to violent offenders lacking abuse (Raine, Park, et al., 2001). In these two examples, it should be noted that the dependent (outcome) variable was brain function.

Turning to the second issue, when instead the outcome variable is psychopathy/violence, it appears that brain deficits can combine with family adversity in the prediction of antisocial behavior. An aMRI study of individuals with ASPD and high psychopathy scores (Raine et al., 2000) showed that the combination of reduced prefrontal gray volume, low autonomic responsivity, and a set of 10 psychosocial deficits (e.g., abuse, singleparent family, and parental criminality) correctly classified 88.5% of subjects into ASPD or control groups (compared to 73% for psychosocial predictors only, and 76.9% for biological predictors only). A second structural imaging study focusing on the corpus callosum in high-psychopathy individuals showed that the combination of psychosocial risk factors with callosal measures accounted for 81.5% of the variance in APSD/psychopathy versus control group membership (Raine, Lencz, et al., 2003). It should be noted that structural brain measures accounted for a significant increase in the variance in psychopathic/antisocial behavior *over and above* psychosocial risk factors in both studies. Yet more brain imaging studies are still needed to obtain greater clarification regarding the role of the social environment in relation to brain deficits and violence.

## Do Brain Deficits *Cause* Psychopathic Behavior?

While brain deficits are reliably found in antisocial and psychopathic individuals, brain-imaging studies by themselves do not demonstrate that these deficits actually cause psychopathy. Nevertheless, findings from adult neurological patients, child neurological cases, head injury studies, and patients with degenerative brain diseases converge with brain imaging studies of psychopathy and violent antisocial behavior on the conclusion that damage to the brain can indeed directly contribute to the etiology of these conditions.

Neurological research on individuals who were once normal but then suffered brain lesions allows temporal cause-effect relationships to be teased out. Damasio and colleagues have convincingly demonstrated that damage to the ventral regions of the prefrontal cortex results in poor decision making, autonomic deficits, and sociopathic behavior (Damasio, 1994; Damasio et al., 1990). A quasi-experimental group study on head injuries in soldiers revealed that individuals with ventromedial lesions showed greater aggressive, violent, and/or antisocial behavior than patients with nonfrontal lesions or control participants (Grafman et al., 1996). Among the ventromedial patients, those with focal frontomedial lesions were generally aware of and able to self-report the increase in their aggressive behavior, whereas those with focal orbitofrontal lesions were unaware of the behavioral change. These early findings are corroborated by findings from several case studies of acquired psychopathy and aggressive behavior following lesions or congenital malformation of the medial orbitofrontal regions (Boes et al., 2011; Orellana et al., 2013).

Another line of evidence supporting a causative role of brain dysfunction in predisposing to violent/psychopathic behavior comes from several studies of patients who suffered degenerating brain diseases and thereafter became aggressive (Raine, 2002). For example, patients diagnosed with frontotemporal dementia (FTD) are more likely to engage in inappropriate aggressive, sexual, and antisocial behavior than are patients diagnosed with Alzheimer's disease (Miller, Darby, Benson, Cummings, & Miller, 1997). In a more recent study, it was reported that impulsive psychopathic patients were more likely to have frontally predominant illnesses such as FTD or Huntington's disease, whereas non-impulsive patients tended to have Alzheimer's disease or prominent aphasia (Mendez, Shapira, & Saul, 2011). In addition, aggressive dementia patients show significant hypoperfusion (i.e., reduced activation) in the left and right dorsolateral frontal areas, left anterior temporal cortex, and right superior parietal areas compared to nonaggressive patients with dementia (Hirono et al., 2000). Finally, a SPECT study of patients with right-sided (but not left-sided) frontotemporal dementia revealed evidence of socially undesirable behavior, including criminality, aggression, and sexually deviant behavior (Mychack, Kramer, Boone, & Miller, 2001). Similarly, studies of children with lesions to the prefrontal cortex early in life also lend support to the view that brain trauma can directly lead to antisocial, aggressive behavior (Anderson, Damasio, Tranel, & Damasio, 2000). Nevertheless, further studies are required to extend this analysis to psychopathic behavior in particular.

## How Do Brain Impairments Cause Psychopathic Behavior?

What are the mechanisms and processes by which structural brain impairments predispose an individual to psychopathy? This question is considered in the context of the multiple brain mechanisms implicated in psychopathic and antisocial behavior from existing neuroimaging research.

## **Prefrontal Cortex**

There are multiple pathways by which prefrontal impairments may predispose to psychopathic behavior. First, patients with prefrontal damage fail to generate anticipatory autonomic responses to choice options that are risky and make bad choices even when they are aware of the more advantageous response option (Bechara et al., 1997). This inability to reason and to make appropriate decisions in risky situations is likely to contribute to the impulsivity, rule breaking, poor behavioral control, lack of realistic long-term goals, and irresponsible behavior that characterize high-psychopathy individuals (Hare, 2003).

Second, as part of a neural circuit that plays a central role in fear conditioning and stress responsivity, prefrontal abnormalities may result in the poor fear conditioning that consistently has been found in psychopathic and antisocial groups (Anton, Baskin-Sommers, Vitale, Curtin, & Newman, 2012; Patrick, 1994; Rothemund et al., 2012; Sommer et al., 2006; Veit et al., 2013), and is predictive of later aggressive behavior (Gao, Raine, Venables, Dawson, & Mednick, 2010). Poor conditioning is theorized to be associated with poor conscience development (Kochanska, 1997; Raine, 1993), and individuals who are less autonomically responsive to aversive stimuli such as parental verbal and physical punishment during childhood would be less susceptible to socializing punishments and hence become predisposed to psychopathy.

Third, prefrontal dysfunction may result in abnormalities in arousal regulation, which in turn predispose to psychopathy (Casey, Rogers, Burns, & Yiend, 2013). Low physiological arousal has been associated with stimulation-seeking behavior to compensate for such underarousal (Zuckerman, 1990), behavior which characterizes both psychopathic and antisocial populations (Gatzke-Kopp, Raine, Loeber, Stouthamer-Loeber, & Steinhauer, 2002). Raine and colleagues (2000) reported that individuals with ASPD showed lower autonomic activity (both skin conductance and heart rate) during a social stressor task. Furthermore, individuals with the lowest prefrontal gray-matter volumes had the lowest skin conductance arousal, indicating an intrinsic link between electrodermal arousal and prefrontal gray-matter integrity in this group. This arousal and stress reactivity dysregulation produced by prefrontal damage may contribute to emotion regulation problems that in turn contribute to aggressive and psychopathic behavior (Davidson et al., 2000; Scarpa & Raine, 1997).

## **Corpus Callosum**

Deficits to the corpus callosum and consequent abnormal interhemispheric transfer may result in the right hemisphere, which has been implicated in the generation of negative affect (Davidson & Fox, 1989), undergoing less regulation and control by left-hemisphere inhibitory processes. This impairment in affect regulation may in turn contribute to the expression of aggressive, unregulated behavior (Schutter & Harmon-Jones, 2013). As an example, rats that are stressed early in life are right-hemisphere dominant for mice killing (Garbanati et al., 1983). Severing the corpus callosum in these rats leads to an increase in muricide (Denenberg, Gall, Berrebi, & Yutzey, 1986), indicating that the left hemisphere acts to inhibit the right-hemisphere-mediated killing via an intact corpus callosum. This is supported by findings of inappropriate emotional expression and inability to grasp long-term implications of a situation in split-brain patients (Uddin, 2011). Parallel influences may contribute to the inappropriate emotional expression of violent psychopaths and their lack of long-term planning.

A key feature of psychopathy is blunted affect, and low autonomic activity during emotional and social stressors is a well-replicated correlate of psychopathy. In the previously cited study on corpus callosum structure in psychopathy by Raine, Lencz, and colleagues (2003), callosal white-matter volume was significantly related to the deficient affect factor of psychopathy, and to a lesser extent the impulsive-irresponsible factor, but not the arrogant-deceitful factor. Similarly, autonomic measures and personality measures reflecting blunted affect, lack of social closeness, and no close friends were related to callosal abnormalities. Individuals who suffer from neurodevelopmental failure of the corpus callosum, while not showing gross psychopathology, do show deficits in social insight and self-perception (Paul et al., 2007; Symington, Paul, Symington, Ono, & Brown, 2010) —deficits that also characterize individuals high in psychopathy. As such, abnormal interhemispheric connectivity may account in part for the social, emotional, and autonomic deficits exhibited by psychopathic individuals.

#### Neurodevelopmental Processes

Finally, consideration should be given to the developmental context within which brain deficits may give rise to psychopathy. No matter what brain deficits are observed in psychopathic individuals, and irrespective of the ways in which impairments to specific brain regions can give rise to cognitive and behavioral alterations that predispose to psychopathy, one single process could conceivably underlie these multiple processes. Specifically, structural and functional brain impairments in psychopathic individuals may be caused by abnormal neurodevelopment (Gao, Glenn, Schug, Yang, & Raine, 2009; Schug et al., 2010). For example, with respect to callosal structural abnormalities in such individuals, animal research has shown that approximately two-thirds of callosal axons are eliminated postnatally through adulthood, with most of this pruning occurring in excitatory rather than inhibitory fibers. Early arrest of this normal process of axonal pruning could therefore contribute to the increased callosal white-matter volume and functional overconnectedness of the hemispheres observed in high-psychopathy individuals (Raine, Lencz, et al., 2003).

Another line of evidence comes from work on the identification of markers for fetal neural maldevelopment, such as abnormalities in the cavum septum pellucidum. The septum pellucidum is one component of the septum and consists of a deep midline structure made up of two translucent leaves of glia separating the lateral ventricles, forming part of the septohippocampal system. The closure of these two leaves is attributed to rapid development of midline structures such as hippocampus, amygdala, and the corpus callosum, and the lack of such limbic development may result in preservation of the cavum septum pellucidum into adulthood. With regard to psychopathy, Raine, Lee, Yang, and Colletti (2010) found that individuals with a cavum septum pellucidum had significantly higher levels of antisocial personality and psychopathy than those lacking a cavum septum pellucidum. These results were corroborated by White and colleagues (2013), who reported enlargement of the cavum septum pellucidum to be associated with disruptive behavior disorders, proactive aggression, and elevated psychopathic traits in children. This neurodevelopmental marker was not found to be more prevalent in a small group of violent offenders than in controls in a subsequent study by Toivonen and colleagues (2013), although given that only four individuals in the entire study had a cavum septum pellucidum, definitive conclusions cannot be drawn from this Finnish study. Overall, the findings of Raine and colleagues and White and colleagues are suggestive of a neurodevelopmental basis to antisocial and psychopathic traits.

In a similar fashion, the observed asymmetry in the structure of the anterior hippocampus in psychopathic individuals (Raine et al., 2004) may have a neurodevelopmental explanation. Atypical brain asymmetries are thought partly to reflect disrupted neurodevelopmental processes. Such disruption probably occurs early in life because brain asymmetries first emerge during fetal development, and the overall degree of structural changes attributable to environmental influences is limited by early morphogenesis. Overall, strong evidence suggests a neurodevelopmental pathway to psychopathy, which is consistent with data indicating that it has its roots early in life, it is in part genetically determined, it unfolds relatively consistently over childhood and adolescence, and is impervious to conventional treatments (Raine et al., 2004).

## What *Causes* the Brain Deficits in Psychopathic Individuals?

Environmental factors may play a role in shaping structural brain deficits in psychopathic individuals. As outlined earlier, head injuries from physical child abuse, car and motorcycle accidents, fights, and sports are an important source of brain damage. Closed head injuries are particularly likely to create damage to the frontal and temporal poles; thus, it is not surprising that anterior (frontal and temporal) abnormalities are particularly implicated in psychopathic and antisocial behavior. However, few studies to date have attempted to directly assess whether accidents and child abuse mediate brain dysfunction in offenders or highpsychopathy individuals. One study of individuals convicted of murder revealed a trend (p < .08) for murderers with a history of head injury to have lower functioning of the corpus callosum than murderers without head injury (Raine, Phil, et al., 1998), and it is known that long white nerve fibers are susceptible to shearing during closed head injury. On the other hand, other brain deficits found in these murderers, including reduced prefrontal glucose metabolism, were not linked to a history of head injury. Nevertheless, one fMRI study found that violent offenders with a history of child abuse had greater brain dysfunction than non-abused violent offenders (Raine, Park, et al., 2001), suggesting the potential importance of environmental factors in the etiology of functional brain impairments.

However, there are important caveats to this conclusion. Murderers with a history of serious abuse early in childhood were *not* found to suffer from brain deficits relative to murderers without such abuse (Raine, Phil, et al., 1998). Importantly, one aMRI study of psychopathy that examined the issue of environmental etiology showed that structural abnormalities of the corpus callosum in this group were not attributable to head injury, child abuse, or other psychosocial risk factors (Raine, Lencz, et al., 2003). However, a study by Kumari and colleagues (2014) showed that the volume of anterior cingulate cortex correlated negatively with childhood psychosocial deprivation, as well as with physical and sexual abuse, in a group of seriously violent psychiatric patients diagnosed with ASPD or schizophrenia. More studies that specifically focus on clinically psychopathic individuals are needed to further address this potentially important issue.

Drug and alcohol abuse may in theory also contribute to the brain deficits found in psychopathic individuals. On the other hand, these factors may not be as salient as they first appear. For example, individuals with ASPD and high psychopathy scores show significant prefrontal gray reductions compared not only to normal controls but also to alcohol- and drug-dependent individuals not diagnosed with ASPD-indicating that substance abuse does not account for the observed structural brain deficits (Raine et al., 2000). Other studies have likewise demonstrated structural and functional brain deficits in antisocial and violent offenders when alcohol and drug use is controlled for (Critchley et al., 2000; Hirono et al., 2000; Kuruoglu et al., 1996). One study showed a more complex relationship wherein reduced gray-matter volumes in the orbitofrontal and ventromedial prefrontal cortex were linked to substance use disorders in a group of violent offenders, whereas larger amygdala and striatal volumes and reduced insula volume were linked to aggressive behavior and psychopathy scores (Schiffer et al., 2011). While alcohol and drug use may be a cause of some observed brain deficits in violent offenders, the evidence at this time is inconclusive.

Early health factors may be another source of brain impairment. Birth complications have been associated with antisocial, violent behavior (Liu, Raine, Venables, & Mednick, 2009; Raine, Brennan, & Mednick, 1994), and lack of oxygen at birth leads to cell death, particularly in the hippocampus, a brain region linked to violence and psychopathy (Laakso et al., 2001; Raine et al., 2004). Protein is essential for brain development, and protein deficiency has been linked to antisocial behavior problems (Liu & Raine, 2006; Liu, Raine, Venables, & Mednick, 2004; Neugebauer, Hoek, & Susser, 1999). Rats fed a low-protein diet during pregnancy show impairments in corpus callosum functioning (Soto-Moyano et al., 1998), reduced DNA concentration in the forebrain (Bennis-Taleb, Remacle, Hoet, & Reusens, 1999), and altered dopamine circuitry (Vucetic et al., 2010), all crucial for the development of psychopathy. Fetal alcohol syndrome, in which the fetus is exposed to alcohol *in utero*, results in significant structural and functional brain deficits, most prominently in the corpus callosum (Yang, Phillips, et al., 2012), and could contribute to brain deficits in psychopathic individuals. Smoking during pregnancy can lead to brain impairments, including smaller frontal lobe volume and cortical thickness (El Marroun et al., 2014), by reducing oxygen to the fetal brain and has been linked to antisocial, violent behavioral outcomes (Brennan, Mednick, & Hodgins, 2000; D'Onofrio et al., 2010; Rice et al., 2009). Although these early health factors are likely to contribute to brain dysfunction in psychopathy, their role needs to be formally tested in future studies.

It seems likely that brain deficits in psychopathic individuals are caused by a combination of both early environmental health factors and genetic processes. Twin and adoption studies have demonstrated beyond doubt that there is heritability for criminal behavior (Raine, 2002) and psychopathy (Bezdjian, Raine, Baker, & Lynam, 2011; Gunter, Vaughn, & Philibert, 2010; Tuvblad, Bezdjian, Raine, & Baker, 2014). One MRI twin study demonstrated that variations in brain structure, particularly the thickness of frontal cortices, are largely contributed by genetic factors (Yang, Joshi, et al., 2012). Consequently, genetic vulnerability is likely to play a crucial role in producing the type of structural brain deficits that have been reported in individuals with psychopathic behavior and ASPD.

## Can Brain Deficits in Psychopathic Individuals Be Remediated or Prevented?

The question of whether brain deficits observed in psychopathic individuals can be reversed or prevented is of major societal importance. If brain deficits cause psychopathy, and if they can be remediated, one might predict that the impact of psychopathy in society can be significantly reduced. This issue can be viewed through past, present, and future lenses. In the past, neurosurgery (i.e., frontal lobectomies, amygdalectomy) was used to treat severe cases of aggression, with some degree of success, but such approaches later fell into disrepute as being crude and unethical in many cases. Clearly, it is unlikely that such drastic psychosurgical intervention will ever be warranted for the treatment of psychopathy.

On the other hand, studies have begun to show that brain structure and function are significantly shaped by environmental processes. For example, one line of work has shown that an enrichment program involving nutritional, physical exercise, and educational components administered for 2 years between ages 3 and 5 is associated with better brain functioning 8 years later (i.e., at age 11; Raine, Venables, et al., 2001) and with reductions in later conduct problems at age 17 and criminal behavior at age 23 (Raine, Mellingen, Liu, Venables, & Mednick, 2003). Specifically, recipients of this intervention showed greater EEG activation and increased skin conductance orienting responses to simple tone stimuli. These findings are supported by several recent animal studies of environmental enrichment. For example, environmental enrichment was shown to effectively increase the number of surviving neurons in the motor cortex in rats with diabetes and stress (Pamidi, Nayak, Mohandas, Rao, & Madhay, 2014). In addition to nutrition, which is critical to brain development, physical exercise by itself has also been shown to potentially promote neurogenesis-the growth of new brain cells-within the hippocampus (Yau, Gil-Mohapel, Christie, & So. 2014).

It is also conceivable that children who show both frontal brain deficits and psychopath-like personalities may benefit from attempts to cognitively remediate the executive function deficits that some believe contribute to psychopathy. In recent years, researchers have begun to explore the effectiveness of cognitive training, particularly in individuals with brain injury (Cook, Chapman, Elliott, Evenson, & Vinton, 2014; Van Vleet, Chen, Vernon, Novakovic-Agopian, & D'Esposito, 2015). In a recent meta-analysis review, Patel, Spreng, and Turner (2013) demonstrated reliable activation changes in the frontal and striatal regions following cognitive and motor skills training. Because brain function is more easily shaped and influenced early in life, such intervention programs may be much more successful in remediating cognitive deficits in younger versus older psychopathic individuals. Any such attempts, by necessity, must be tempered by sensitivity to protecting the rights of children and avoiding negative effects of labeling.

In the future, the key question concerns whether reparative brain surgery might be used to remediate the structural and functional brain deficits observed in psychopathic offenders. Lesions to the hippocampus impair spatial learning in rats, but grafting of stem cells into these animals reverses these cognitive deficits (Grigoryan, Gray, Rashid, Chadwick, & Hodges, 2000). Similarly, transplants of stem cells from human brains into old rats results in migration of these cells to the hippocampus, improving cognitive ability in old rats within 4 weeks of transplantation (Qu, Brannen, Kim, & Sugaya, 2001). It is possible that in the future, adult offenders with damage to the hippocampus and prefrontal cortex might receive treatment to literally "repair" these brain structures, opening up the possibility of reversal of cognitive and behavioral brain deficits implicated in the etiology of violence. However, evidence to date suggests that existing knowledge regarding human neurogenesis is far from sufficient to warrant translational use for brain repair (Peretto & Bonfanti, 2014). Whether this possible intervention approach ever becomes acceptable, ethically or morally, to candidate offenders and to the public at large remains to be seen.

## **Conclusions and Summary**

In this chapter, we have sought to highlight the accumulated evidence regarding the neuroanatomical basis of psychopathic behavior derived from two decades of brain imaging research, and to discuss broader conceptual issues stemming from these empirical findings. In essence, brain deficits, particularly in the frontal cortex, temporal cortex, amygdala and hippocampus, corpus callosum, and the striatum, have been observed most robustly in antisocial, violent, and/or psychopathic individuals. However, as discussed earlier, a critical need remains for researchers in the field to address the more complex questions of why brain impairments may cause psychopathy, what causes the impairments, and how they might be remediated.

Despite these limitations, initial suggestions may be offered to help guide future research efforts in this area. Clearly, any future imaging studies, whether anatomical or functional, would benefit from additional analyses into the features and subtypes of psychopathy that drive the overall findings for psychopathic behavior, as such knowledge would help to further pinpoint potential etiological processes. Future studies that combine multimodal imaging techniques would clearly help address the pivotal but unanswered question of how impairments at structural, functional, molecular, and connectivity levels are related—and if not, why not? If future anatomical studies could incorporate basic environmental and early health processes hypothesized to be of etiological significance to psychopathy, they could more effectively enrich our understanding of interactions between brain and social influences that operate to shape psychopathic behavior. Recent studies have begun to investigate more complex gene  $\times$  environment (G  $\times$  E) effects on brain development associated with psychopathic traits using genetically informative designs, which have the potential to advance knowledge of specific genes or brain endophenotypes that may predispose to psychopathy in the future. As such, the neuroanatomy of psychopathy is a research field with a great deal of potential to contribute to the knowledge base required for a sustained, multinational effort toward preventing and remediating psychopathy and the costly toll it exacts on individuals and societies worldwide.

#### ACKNOWLEDGMENT

This chapter was written with the support of Pathway to Independence Award No. MH093388 from the National Institute of Mental Health to Yaling Yang.

#### REFERENCES

- Amen, D. G., Stubblefield, M., Carmichael, B., & Thisted, R. (1996). Brain SPECT findings and aggressiveness. Annals of Clinical Psychiatry, 8, 129–137.
- American Psychiatric Association. (1980). Diagnostic and statistical manual of mental disorders (3rd ed.). Washington, DC: Author.
- American Psychiatric Association. (1987). Diagnostic and statistical manual of mental disorders (3rd ed., rev.). Washington, DC: Author.
- American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: Author.
- Andershed, H., Kerr, M., Stattin, H., & Levander, S. (2002). Psychopathic traits in non-referred youths: A new assessment tool. In E. Blaauw & L. Sheridan (Eds.), Psychopaths: Current international perspectives (pp. 131–158). The Hague: Elsevier.
- Anderson, S. W., Damasio, H., Tranel, D., & Damasio, A. R. (2000). Long-term sequelae of prefrontal cortex damage acquired in early childhood. *Developmental Neuropsychology*, 18, 281–296.

- Anton, M. E., Baskin-Sommers, A. R., Vitale, J. E., Curtin, J. J., & Newman, J. P. (2012). Differential effects of psychopathy and antisocial personality disorder symptoms on cognitive and fear processing in female offenders. Cognitive, Affective, and Behavioral Neuroscience, 12, 761–776.
- Barkataki, I., Kumari, V., Das, M., Taylor, P., & Sharma, T. (2006). Volumetric structural brain abnormalities in men with schizophrenia or antisocial personality disorder. Behavioural Brain Research, 169, 239–247.
- Bechara, A., Damasio, H., Tranel, D., & Damasio, A. R. (1997). Deciding advantageously before knowing the advantageous strategy. *Science*, 275, 1293–1295.
- Bennis-Taleb, N., Remacle, C., Hoet, J. J., & Reusens, B. (1999). A low-protein isocaloric diet during gestation affects brain development and alters permanently cerebral cortex blood vessels in rat offspring. *Journal of Nutrition*, 129, 1613–1619.
- Bezdjian, S., Raine, A., Baker, L. A., & Lynam, D. R. (2011). Psychopathic personality in children: Genetic and environmental contributions. *Psychological Medicine*, 41, 589–600.
- Birbaumer, N., Veit, R., Lotze, M., Erb, M., Hermann, C., Grodd, W., et al. (2005). Deficient fear conditioning in psychopathy: A functional magnetic resonance imaging study. Archives of General Psychiatry, 62, 799–805.
- Blair, R. J. (2008). The amygdala and ventromedial prefrontal cortex: Functional contributions and dysfunction in psychopathy. *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, 363, 2557–2565.
- Blair, R. J. (2013). The neurobiology of psychopathic traits in youths. *Nature Reviews Neuroscience*, 14, 786–799.
- Boccardi, M., Bocchetta, M., Aronen, H. J., Repo-Tiihonen, E., Vaurio, O., Thompson, P. M., et al. (2013). Atypical nucleus accumbens morphology in psychopathy: Another limbic piece in the puzzle. *International Journal of Law and Psychiatry*, 36, 157–167.
- Boccardi, M., Frisoni, G. B., Hare, R. D., Cavedo, E., Najt, P., Pievani, M., et al. (2011). Cortex and amygdala morphology in psychopathy. *Human Brain Mapping*, 193, 85–92.
- Boccardi, M., Ganzola, R., Rossi, R., Sabattoli, F., Laakso, M. P., Repo-Tiihonen, E., et al. (2010). Abnormal hippocampal shape in offenders with psychopathy. *Human Brain Mapping*, 31, 438–447.
- Boes, A. D., Grafft, A. H., Joshi, C., Chuang, N. A., Nopoulos, P., & Anderson, S. W. (2011). Behavioral effects of congenital ventromedial prefrontal cortex malformation. BMC *Neurology*, 11, 151.
- Brennan, P. A., Mednick, S. A., & Hodgins, S. (2000). Major mental disorders and criminal violence in a Danish birth cohort. Archives of General Psychiatry, 57, 494–500.
- Bukowski, W. M., Schwartzman, A., Santo, J., Bagwell, C., & Adams, R. (2009). Reactivity and distortions in the self: Narcissism, types of aggression, and the

functioning of the hypothalamic–pituitary–adrenal axis during early adolescence. *Development and Psy-chopathology*, 21, 1249–1262.

- Casey, H., Rogers, R. D., Burns, T., & Yiend, J. (2013). Emotion regulation in psychopathy. *Biological Psy*chology, 92, 541–548.
- Cohn, M. D., Popma, A., van den Brink, W., Pape, L. E., Kindt, M., van Domburgh, L., et al. (2013). Fear conditioning, persistence of disruptive behavior and psychopathic traits: An fMRI study. *Translational Psychiatry*, 3, e319.
- Contreras-Rodriguez, O., Pujol, J., Batalla, I., Harrison, B. J., Soriano-Mas, C., Deus, J., et al. (2015). Functional connectivity bias in the prefrontal cortex of psychopaths. *Biological Psychiatry*, 78, 647–655.
- Cook, L. G., Chapman, S. B., Elliott, A. C., Evenson, N. N., & Vinton, K. (2014). Cognitive gains from gist reasoning training in adolescents with chronic-stage traumatic brain injury. *Frontiers in Neurology*, 5, 87.
- Cooke, D. J., & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment*, 13, 171–188.
- Cope, L. M., Shane, M. S., Segall, J. M., Nyalakanti, P. K., Stevens, M. C., Pearlson, G. D., et al. (2012). Examining the effect of psychopathic traits on gray matter volume in a community substance abuse sample. *Psychiatry Research*, 204, 91–100.
- Craig, M. C., Catani, M., Deeley, Q., Robert, L., Daly, E., Kanaan, R. A. A., et al. (2009). Altered connections on the road to psychopathy. *Molecular Psychia*try, 14, 946–953.
- Critchley, H. D., Simmons, A., Daly, E. M., Russell, A., van Amelsvoort, T., Robertson, D. M., et al. (2000). Prefrontal and medial temporal correlates of repetitive violence to self and others. *Biological Psychiatry*, 47, 928–934.
- Damasio, A. R. (1994). Descartes' error and the future of human life. Scientific American, 271, 144.
- Damasio, A. R., Trabel, D., & Damasio, H. (1990). Individuals with sociopathic behavior caused by frontal damage fail to respond autonomically to social stimuli. *Behavioural Brain Research*, 41, 81–94.
- Damasio, H., Grabowski, T., Frank, R., Galaburda, A. M., & Damasio, A. R. (1994). The return of Phineas Gage: Clues about the brain from the skull of a famous patient. *Science*, 264, 1102–1105.
- Davidson, R. J., & Fox, N. A. (1989). Frontal brain asymmetry predicts infants' response to maternal separation. Journal of Abnormal Psychology, 98, 127–131.
- Davidson, R. J., Putnam, K. M., & Larson, C. L. (2000). Dysfunction in the neural circuitry of emotion regulation—a possible prelude to violence. *Science*, 289, 591–594.
- de Oliveira-Souza, R., Hare, R. D., Bramati, I. E., Garrido, G. J., Azevedo Ignacio, F., Tovar-Moll, F., et al. (2008). Psychopathy as a disorder of the moral brain: Fronto-temporo-limbic grey matter reductions demonstrated by voxel-based morphometry. *NeuroImage*, 40, 1202–1213.

- Denenberg, V. H., Gall, J. S., Berrebi, A., & Yutzey, D. A. (1986). Callosal mediation of cortical inhibition in the lateralized rat brain. *Brain Research*, 397, 327–332.
- Dolan, M., Deakin, J. F. W., Roberts, N., & Anderson, I. M. (2002). Quantitative frontal and temporal structural MRI studies in personality-disordered offenders and control subjects. *Psychiatry Research Neuroimaging*, 116, 133–149.
- D'Onofrio, B. M., Singh, A. L., Iliadou, A., Lambe, M., Hultman, C. M., Grann, M., et al. (2010). Familial confounding of the association between maternal smoking during pregnancy and offspring criminality: A population-based study in Sweden. Archives of General Psychiatry, 67, 529–538.
- El Marroun, H., Schmidt, M. N., Franken, I. H., Jaddoe, V. W., Hofman, A., van der Lugt, A., et al. (2014). Prenatal tobacco exposure and brain morphology: A prospective study in young children. *Neuropsychopharmacology*, 39, 792–800.
- Ermer, E., Cope, L. M., Nyalakanti, P. K., Calhoun, V. D., & Kiehl, K. A. (2012). Aberrant paralimbic gray matter in criminal psychopathy. *Journal of Abnormal Psychology*, 121, 649–658.
- Fairchild, G., Hagan, C. C., Walsh, N. D., Passamonti, L., Calder, A. J., & Goodyer, I. M. (2013). Brain structure abnormalities in adolescent girls with conduct disorder. *Journal of Child Psychology and Psychia*try, 54, 86–95.
- Finger, E. C., Marsh, A. A., Blair, K. S., Reid, M. E., Sims, C., Ng, P., et al. (2011). Disrupted reinforcement signaling in the orbitofrontal cortex and caudate in youths with conduct disorder or oppositional defiant disorder and a high level of psychopathic traits. American Journal of Psychiatry, 168, 152–162.
- Finger, E. C., Marsh, A. A., Mitchell, D. G., Reid, M. E., Sims, C., Budhani, S., et al. (2008). Abnormal ventromedial prefrontal cortex function in children with psychopathic traits during reversal learning. Archives of General Psychiatry, 65, 586–594.
- Fullam, R. S., McKie, S., & Dolan, M. C. (2009). Psychopathic traits and deception: Functional magnetic resonance imaging study. *British Journal of Psychiatry*, 194, 229–235.
- Ganis, G., Kosslyn, S. M., Stose, S., Thompson, W. L., & Yurgelun-Todd, D. A. (2003). Neural correlates of different types of deception: An fMRI investigation. *Cerebral Cortex*, 13, 830–836.
- Gao, Y., Glenn, A. L., Schug, R. A., Yang, Y., & Raine, A. (2009). The neurobiology of psychopathy: A neurodevelopmental perspective. *Canadian Journal of Psychiatry*, 54, 813–823.
- Gao, Y., Raine, A., Venables, P. H., Dawson, M. E., & Mednick, S. A. (2010). Reduced electrodermal fear conditioning from ages 3 to 8 years is associated with aggressive behavior at age 8 years. Journal of Child Psychology and Psychiatry and Allied Disciplines, 51, 550–558.
- Garbanati, J. A., Sherman, G. F., Rosen, G. D., Hof-

mann, M., Yutzey, D. A., & Denenberg, V. H. (1983). Handling in infancy, brain laterality and muricide in rats. *Behavioural Brain Research*, *7*, 351–359.

- Gatzke-Kopp, L. M., Beauchaine, T. P., Shannon, K. E., Chipman, J., Fleming, A. P., Crowell, S. E., et al. (2009). Neurological correlates of reward responding in adolescents with and without externalizing behavior disorders. *Journal of Abnormal Psychology*, 118, 203–213.
- Gatzke-Kopp, L. M., Raine, A., Buchsbaum, M., & LaCasse, L. (2001). Temporal lobe deficits in murderers: EEG findings undetected by PET. *Journal of Neuro*psychiatry and Clinical Neurosciences, 13, 486–491.
- Gatzke-Kopp, L. M., Raine, A., Loeber, R., Stouthamer-Loeber, M., & Steinhauer, S. R. (2002). Serious delinquent behavior, sensation seeking, and electrodermal arousal. *Journal of Abnormal Child Psychology*, 30, 477–486.
- Glenn, A. L., Raine, A., Yaralian, P. S., & Yang, Y. (2009). Increased volume of the striatum in psychopathic individuals. *Biological Psychiatry*, 67, 52–58.
- Glenn, A. L., & Yang, Y. (2012). The potential role of the striatum in antisocial behavior and psychopathy. *Biological Psychiatry*, 72, 817–822.
- Goethals, I., Audenaert, K., Jacobs, F., Van den Eynde, F., Bernagie, K., Kolindou, A., et al. (2005). Brain perfusion SPECT in impulsivity-related personality disorders. *Behavioural Brain Research*, 157, 187–192.
- Goyer, P. F., Andreason, P. J., Semple, W. E., & Clayton, A. H. (1994). Positron-emission tomography and personality disorders. *Neuropsychopharmacology*, 10, 21–28.
- Grafman, J., Schwab, K., Warden, D., Pridgen, A., Brown, H. R., & Salazar, A. M. (1996). Frontal lobe injuries, violence and aggression: A report of the Vietnam Head Injury Study. *Neurology*, 46, 1231– 1238.
- Gregory, S., ffytche, D., Simmons, A., Kumari, V., Howard, M., Hodgins, S., et al. (2012). The antisocial brain: Psychopathy matters. Archives of General Psychiatry, 69, 962–972.
- Grigoryan, G. A., Gray, J. A., Rashid, T., Chadwick, A., & Hodges, H. (2000). Conditionally immortal neuroepithelial stem cell grafts restore spatial learning in rats with lesions at the source of cholinergic forebrain projections cholinergic forebrain projections. *Restorative Neurology and Neuroscience*, 17, 1.
- Gunter, T. D., Vaughn, M. G., & Philibert, R. A. (2010). Behavioral genetics in antisocial spectrum disorders and psychopathy: A review of the recent literature. Behavioral Sciences and the Law, 28, 148–173.
- Han, T., Alders, G. L., Greening, S. G., Neufeld, R. W., & Mitchell, D. G. (2012). Do fearful eyes activate empathy-related brain regions in individuals with callous traits? *Social Cognitive and Affective Neuroscience*, 7, 958–968.
- Hare, R. D. (2003). Manual for the Revised Psychopathy Checklist (2nd ed.). Toronto: Multi-Health Systems.
- Herpers, P. C., Scheepers, F. E., Bons, D. M., Buitelaar,

J. K., & Rommelse, N. N. (2014). The cognitive and neural correlates of psychopathy and especially callous–unemotional traits in youths: A systematic review of the evidence. *Development and Psychopathol*ogy, 26, 245–273.

- Hiatt, K. D., & Newman, J. P. (2007). Behavioral evidence of prolonged interhemispheric transfer time among psychopathic offenders. *Neuropsychology*, 21, 313–318.
- Hirono, N., Mega, M. S., Dinov, I. D., Mishkin, F., & Cummings, J. L. (2000). Left frontotemporal hypoperfusion is associated with aggression in patients with dementia. Archives of Neurology, 57, 861–866.
- Intrator, J., Hare, R., Stritzke, P., Brichtswein, K., Dorfman, D., Harpur, T., et al. (1997). A brain imaging (single photon emission computerized tomography) study of semantic and affective processing in psychopaths. *Biological Psychiatry*, 42, 96–103.
- Ishikawa, S. S., Raine, A., Lencz, T., Bihrle, S., & LaCasse, L. (2001). Autonomic stress reactivity and executive functions in successful and unsuccessful criminal psychopaths from the community. *Journal* of Abnormal Psychology, 110, 423–432.
- Jiang, W., Liu, H., Liao, J., Ma, X., Rong, P., Tang, Y., et al. (2013). A functional MRI study of deception among offenders with antisocial personality disorders. *Neuroscience*, 244, 90–98.
- Kiehl, K. A. (2006). A cognitive neuroscience perspective on psychopathy: Evidence for paralimbic system dysfunction. *Psychiatry Research*, 142, 107–128.
- Kiehl, K. A., Smith, A. M., Hare, R. D., Mendrek, A., Forster, B. B., Brink, J., et al. (2001). Limbic abnormalities in affective processing by criminal psychopaths as revealed by functional magnetic resonance imaging. *Biological Psychiatry*, 50, 677–684.
- Kochanska, G. K. (1997). Multiple pathways to conscience for children with different temperaments: From toddlerhood to age 5. *Developmental Psychol*ogy, 33, 228–240.
- Koenigs, M. (2012). The role of prefrontal cortex in psychopathy. Reviews in the Neurosciences, 23, 253–262.
- Kumari, V., Barkataki, I., Goswami, S., Flora, S., Das, M., & Taylor, P. (2009). Dysfunctional, but not functional, impulsivity is associated with a history of seriously violent behaviour and reduced orbitofrontal and hippocampal volumes in schizophrenia. *Psychiatry Research*, 173, 39–44.
- Kumari, V., Uddin, S., Premkumar, P., Young, S., Gudjonsson, G. H., Raghuvanshi, S., et al. (2014). Lower anterior cingulate volume in seriously violent men with antisocial personality disorder or schizophrenia and a history of childhood abuse. Australian and New Zealand Journal of Psychiatry, 48, 153–161.
- Kuruoglu, A. C., Arikan, Z., Vural, G., Karatas, M., Arac, M., & Isik, E. (1996). Single photon emission computerised tomography in chronic alcoholism: Antisocial personality disorder may be associated with decreased frontal perfusion. *British Journal of Psychiatry*, 169, 348–354.

- Laakso, M. P., Gunning-Dixon, F., Vaurio, O., Repo, E., Soininen, H., & Tiihonen, J. (2002). Prefrontal volume in habitually violent subjects with antisocial personality disorder and type 2 alcoholism. *Psychiatry Research Neuroimaging*, 114, 95–102.
- Laakso, M. P., Vaurio, O., Koivisto, E., Savolainen, L., Eronen, M., Aronen, H. J., et al. (2001). Psychopathy and the posterior hippocampus. *Behavioural Brain Research*, 118, 187–193.
- Larson, C. L., Baskin-Sommers, A. R., Stout, D. M., Balderston, N. L., Curtin, J. J., Schultz, D. H., et al. (2013). The interplay of attention and emotion: Top-down attention modulates amygdala activation in psychopathy. Cognitive, Affective, and Behavioral Neuroscience, 13, 757–770.
- Lee, T. M., Liu, H. L., Tan, L. H., Chan, C. C., Mahankali, S., Feng, C. M., et al. (2002). Lie detection by functional magnetic resonance imaging. *Human Brain Mapping*, 15, 157–164.
- Levenson, M. R., Kiehl, K. A., & Fitzpatrick, C. M. (1995). Assessing psychopathic attributes in a noninstitutionalized population. *Journal of Personality and Social Psychology*, 68, 151–158.
- Lilienfeld, S. O., & Widows, M. R. (2005). Psychopathic Personality Inventory—Revised professional manual. Lutz, FL: Psychological Assessment Resources.
- Liu, H., Liao, J., Jiang, W., & Wang, W. (2014). Changes in low-frequency fluctuations in patients with antisocial personality disorder revealed by resting-state functional MRI. PLOS ONE, 9, e89790.
- Liu, J., & Raine, A. (2006). The effect of childhood malnutrition on externalizing behaviors. Current Opinion in Pediatrics, 18, 565–570.
- Liu, J., Raine, A., Venables, P. H., & Mednick, S. A. (2004). Malnutrition at age 3 years and externalizing behavior problems at ages 8, 11, and 17 years. *American Journal of Psychiatry*, 161, 2005–2013.
- Liu, J., Raine, A., Venables, P. H., & Mednick, S. A. (2009). The association of birth complications and externalizing behavior in early adolescents. *Journal* of Research on Adolescence, 19, 93–111.
- Lopez-Duran, N. L., Olson, S. L., Hajal, N. J., Felt, B. T., & Vazquez, D. M. (2009). Hypothalamic pituitary adrenal axis functioning in reactive and proactive aggression in children. *Journal of Abnormal Child Psychology*, 37, 169–182.
- Ly, M., Motzkin, J. C., Philippi, C. L., Kirk, G. R., Newman, J. P., Kiehl, K. A., et al. (2012). Cortical thinning in psychopathy. *American Journal of Psychiatry*, 169, 743–749.
- Marchewka, A., Jednorog, K., Falkiewicz, M., Szeszkowski, W., Grabowska, A., & Szatkowska, I. (2012). Sex, lies and fMRI—gender differences in neural basis of deception. PLOS ONE, 7, e43076.
- Marsh, A. A., & Cardinale, E. M. (2014). When psychopathy impairs moral judgments: Neural responses during judgments about causing fear. Social Cognitive and Affective Neuroscience, 9, 3–11.
- Mendez, M. F., Shapira, J. S., & Saul, R. E. (2011). The

spectrum of sociopathy in dementia. Journal of Neuropsychiatry and Clinical Neurosciences, 23, 132–140.

- Miller, B. L., Darby, A., Benson, D. F., Cummings, J. L., & Miller, M. H. (1997). Aggressive, socially disruptive and antisocial behaviour associated with frontotemporal dementia. *British Journal of Psychiatry*, 170, 150–154.
- Müller, J. L., Sommer, M., Wagner, V., Lange, K., Taschler, H., Roder, C. H., et al. (2003). Abnormalities in emotion processing within cortical and subcortical regions in criminal psychopaths: Evidence from a functional magnetic imaging study using pictures with emotional content. *Psychiatry Research: Neuroimaging*, 54, 152–162.
- Mychack, P., Kramer, J. H., Boone, K. B., & Miller, B. L. (2001). The influence of right frontotemporal dysfunction on social behavior in frontotemporal dementia. *Neurology*, 56, S11–S15.
- Neugebauer, R., Hoek, H. W., & Susser, E. (1999). Prenatal exposure to wartime famine and development of antisocial personality disorder in early adulthood. *Journal of the American Medical Association*, 282, 455–462.
- Nordstrom, B. R., Gao, Y., Glenn, A. L., Peskin, M., Rudo-Hutt, A. S., Schug, R. A., et al. (2011). Neurocriminology. Advances in Genetics, 75, 255–283.
- Orellana, G., Alvarado, L., Munoz-Neira, C., Avila, R., Mendez, M. F., & Slachevsky, A. (2013). Psychosisrelated matricide associated with a lesion of the ventromedial prefrontal cortex. *Journal of the American Academy of Psychiatry and the Law*, 41, 401–406.
- Osumi, T., Nakao, T., Kasuya, Y., Shinoda, J., Yamada, J., & Ohira, H. (2012). Amygdala dysfunction attenuates frustration-induced aggression in psychopathic individuals in a non-criminal population. *Journal of Affective Disorders*, 142, 331–338.
- Pamidi, N., Nayak, B. S., Mohandas, K. G., Rao, S. S., & Madhav, N. V. (2014). Environmental enrichment exposure restrains the neuronal damage induced by diabetes and stress in the motor cortex of rat brain. *Bratislavské Lekárske Listy*, 115, 197–202.
- Pardini, D. A., Raine, A., Erickson, K., & Loeber, R. (2014). Lower amygdala volume in men is associated with childhood aggression, early psychopathic traits, and future violence. *Biological Psychiatry*, 75, 73–80.
- Patel, R., Spreng, R. N., & Turner, G. R. (2013). Functional brain changes following cognitive and motor skills training: A quantitative meta-analysis. *Neurorehabilitation and Neural Repair*, 27, 187–199.
- Patrick, C. J. (1994). Emotion and psychopathy: Startling new insights. Psychophysiology, 31, 319–330.
- Patrick, C. J. (2014). Physiological correlates of psychopathy, antisocial personality disorder, habitual aggression, and violence. In V. Kumari, N. Boutros, & P. Bob (Eds.), Current topics in behavioral neuroscience: Psychophysiology in psychiatry and psychopharmacology (Vol. 14, pp. 197–226). New York: Springer.
- Paul, L. K., Brown, W. S., Adolphs, R., Tyszka, J. M., Richards, L. J., Mukherjee, P., et al. (2007). Agenesis

of the corpus callosum: Genetic, developmental and functional aspects of connectivity. *Nature Reviews Neuroscience*, 8, 287–299.

- Paulhus, D., Neumann, C. S., & Hare, R. D. (2014). Manual for the Self-Report Psychopathy Scale, version III (SRP-III). Toronto: Multi-Health Systems.
- Peretto, P., & Bonfanti, L. (2014). Major unsolved points in adult neurogenesis: Doors open on a translational future? Frontiers in Neuroscience, 8, 154.
- Pujara, M., Motzkin, J. C., Newman, J. P., Kiehl, K. A., & Koenigs, M. (2014). Neural correlates of reward and loss sensitivity in psychopathy. Social Cognitive and Affective Neuroscience, 9(6), 794–801.
- Qu, T., Brannen, C. L., Kim, H. M., & Sugaya, K. (2001). Human neural stem cells improve cognitive function of aged brain. *NeuroReport*, 12, 1127–1132.
- Raine, A. (1993). The psychopathology of crime: Criminal behavior as a clinical disorder. San Diego, CA: Academic Press.
- Raine, A. (2002). Annotation: The role of prefrontal deficits, low autonomic arousal and early health factors in the development of antisocial and aggressive behavior in children. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 43, 417–434.
- Raine, A., Brennan, P., & Mednick, S. A. (1994). Birth complications combined with early maternal rejection at age 1 year predispose to violent crime at age 18 years. Archives of General Psychiatry, 51, 984–988.
- Raine, A., Buchsbaum, M., & LaCasse, L. (1997). Brain abnormalities in murderers indicated by positron emission tomography. *Biological Psychiatry*, 42, 495– 508.
- Raine, A., Buchsbaum, M., Stanley, J., Lottenberg, S., Abel, L., & Stoddard, J. (1994). Selective reductions in prefrontal glucose metabolism in murderers. *Biological Psychiatry*, 36, 365–373.
- Raine, A., Ishikawa, S. S., Arce, E., Lencz, T., Knuth, K. H., Bihrle, S., et al. (2004). Hippocampal assymmetry in unsuccessful psychopaths. *Biological Psychiatry*, 55, 185–191.
- Raine, A., Lee, L., Yang, Y., & Colletti, P. (2010). Neurodevelopmental marker for limbic maldevelopment in antisocial personality disorder and psychopathy. *British Journal of Psychiatry*, 197, 186–192.
- Raine, A., Lencz, T., Bihrle, S., LaCasse, L., & Colletti, P. (2000). Reduced prefrontal gray matter volume and reduced autonomic activity in antisocial personality disorder. Archives of General Psychiatry, 57, 119–127.
- Raine, A., Lencz, T., Taylor, K., Hellige, J. B., Bihrle, S., LaCasse, L., et al. (2003). Corpus callosum abnormalities in psychopathic individuals. Archives of General Psychiatry, 60, 1134–1142.
- Raine, A., Mellingen, K., Liu, J., Venables, P., & Mednick, S. A. (2003). Effects of environmental enrichment at ages 3–5 years on schizotypal personality and antisocial behavior at ages 17 and 23 years. *American Journal of Psychiatry*, 160, 1627–1635.

- Raine, A., Meloy, J. R., Bihrle, S., Stoddard, J., LaCasse, L., & Buchsbaum, M. S. (1998). Reduced prefrontal and increased subcortical brain functioning assessed using positron emission tomography in predatory and affective murderers. *Behavioral Sciences and the Law*, 16, 319–332.
- Raine, A., Park, S., Lencz, T., Bihrle, S., LaCasse, L., Widom, C. S., et al. (2001). Reduced right hemisphere activation in severely abused violent offenders during a working memory task: An fMRI Study. Aggressive Behavior, 27, 111–129.
- Raine, A., Phil, D., Stoddard, J., Bihrle, S., & Buchsbaum, M. (1998). Prefrontal glucose deficits in murderers lacking psychosocial deprivation. *Neuropsychiatry*, *Neuropsychology*, and Behavioral Neurology, 11, 1–7.
- Raine, A., Reynolds, C., Venables, P. H., Mednick, S. A., & Farrington, D. P. (1998). Fearlessness, stimulation-seeking, and large body size at age 3 years as early predispositions to childhood aggression at age 11 years. Archives of General Psychiatry, 55, 745–751.
- Raine, A., Venables, P. H., Dalais, C., Mellingen, K., Reynolds, C., & Mednick, S. A. (2001). Early educational and health enrichment at age 3–5 years is associated with increased autonomic and central nervous system arousal and orienting at age 11 years: Evidence from the Mauritius Child Health Project. *Psychophysiology*, 38, 254–266.
- Rice, F., Harold, G. T., Boivin, J., Hay, D. F., van den Bree, M., & Thapar, A. (2009). Disentangling prenatal and inherited influences in humans with an experimental design. Proceedings of the National Academy of Sciences of the USA, 106, 2464–2467.
- Rothemund, Y., Ziegler, S., Hermann, C., Gruesser, S. M., Foell, J., Patrick, C. J., et al. (2012). Fear conditioning in psychopaths: Event-related potentials and peripheral measures. *Biological Psychology*, 90, 50–59.
- Scarpa, A., & Raine, A. (1997). Psychophysiology of anger and violent behavior. Psychiatric Clinics of North America, 20, 375–394.
- Schiffer, B., Müller, B. W., Scherbaum, N., Hodgins, S., Forsting, M., Wiltfang, J., et al. (2011). Disentangling structural brain alterations associated with violent behavior from those associated with substance use disorders. Archives of General Psychiatry, 68, 1039– 1049.
- Schiffer, B., Pawliczek, C., Müller, B. W., Forsting, M., Gizewski, E., Leygraf, N., et al. (2014). Neural mechanisms underlying cognitive control of men with lifelong antisocial behavior. *Psychiatry Research*, 222, 43–51.
- Schneider, F., Habel, U., Kessler, C., Posse, S., Grodd, W., & Müller-Gartner, H. W. (2000). Functional imaging of conditioned aversive emotional responses in antisocial personality disorder. *Neuropsychobiology*, 42, 192–201.
- Schug, R. A., Gao, Y., Glenn, A. L., Peskin, M., Yang, Y., & Raine, A. (2010). The developmental evidence base: Neurobiological research and forensic applica-

tions. In G. J. Towl & D. A. Crighton (Eds.), Forensic psychology (pp. 73–87). Oxford, UK: Wiley-Blackwell.

- Schutter, D. J., & Harmon-Jones, E. (2013). The corpus callosum: A commissural road to anger and aggression. Neuroscience and Biobehavioral Reviews, 37, 2481–2488.
- Soderstrom, H., Hultin, L., Tullberg, M., Wikkelso, C., Ekholm, S., & Forsman, A. (2002). Reduced frontotemporal perfusion in psychopathic personality. *Psychiatry Research*, 114, 81–94.
- Soderstrom, H., Tullberg, M., Wikkelso, C., Ekholm, S., & Forsman, A. (2000). Reduced regional cerebral blood flow in non-psychotic violent offenders. *Psychiatry Research*, 98, 29–41.
- Sommer, M., Hajak, G., Dohnel, K., Schwerdtner, J., Meinhardt, J., & Müller, J. L. (2006). Integration of emotion and cognition in patients with psychopathy. *Progress in Brain Research*, 156, 457–466.
- Soto-Moyano, R., Alarcon, S., Hernandez, A., Perez, H., Ruiz, S., Carreno, P., et al. (1998). Prenatal malnutrition-induced functional alterations in callosal connections and in interhemispheric asymmetry in rats are prevented by reduction of noradrenaline synthesis during gestation. *Journal of Nutrition*, 128, 1224–1231.
- Spence, S. A., Farrow, T. F., Herford, A. E., Wilkinson, I. D., Zheng, Y., & Woodruff, P. W. (2001). Behavioural and functional anatomical correlates of deception in humans. *NeuroReport*, 12, 2849–2853.
- Sundram, F., Deeley, Q., Sarkar, S., Daly, E., Latham, R., Craig, M., et al. (2012). White matter microstructural abnormalities in the frontal lobe of adults with antisocial personality disorder. *Cortex*, 48, 216–229.
- Symington, S. H., Paul, L. K., Symington, M. F., Ono, M., & Brown, W. S. (2010). Social cognition in individuals with agenesis of the corpus callosum. *Social Neuroscience*, 5, 296–308.
- Tang, Y., Liu, W., Chen, J., Liao, J., Hu, D., & Wang, W. (2013). Altered spontaneous activity in antisocial personality disorder revealed by regional homogeneity. *NeuroReport*, 24, 590–595.
- Tiihonen, J., Hodgins, S., Vaurio, O., Laakso, M., Repo, E., Soininen, H., et al. (2000). Amygdyloid volume loss in psychopathy. Society for Neuroscience Abstracts, 26(1–2), Abstract No. 7546.
- Toivonen, P., Kononen, M., Niskanen, E., Vaurio, O., Repo-Tiihonen, E., Seppanen, A., et al. (2013). Cavum septum pellucidum and psychopathy. British Journal of Psychiatry, 203, 152–153.
- Tuvblad, C., Bezdjian, S., Raine, A., & Baker, L. A. (2014). The heritability of psychopathic personality in 14- to 15-year-old twins: A multirater, multimeasure approach. Psychological Assessment, 26, 704–716.
- Uddin, L. Q. (2011). Brain connectivity and the self: The case of cerebral disconnection. *Consciousness* and Cognition, 20, 94–98.
- van Elst, L. T., Woermann, F. G., Lemieux, L., Thompson, P. J., & Trimble, M. R. (2000). Affective aggression in patients with temporal lobe epilepsy: A quan-

titative MRI study of the amygdala. Brain, 123(Pt. 2), 234–243.

- Van Vleet, T. M., Chen, A., Vernon, A., Novakovic-Agopian, T., & D'Esposito, M. T. (2015). Tonic and phasic alertness training: A novel treatment for executive control dysfunction following mild traumatic brain injury. *Neurocase*, 21, 489–498.
- Veit, R., Konicar, L., Klinzing, J. G., Barth, B., Yilmaz, O., & Birbaumer, N. (2013). Deficient fear conditioning in psychopathy as a function of interpersonal and affective disturbances. Frontiers in Human Neuroscience 7, 706.
- Volkow, N. D., Tancredi, L. R., Grant, C., Gillespie, H., Valentine, A., Mullani, N., et al. (1995). Brain glucose metabolism in violent psychiatric patients: A preliminary study. *Psychiatry Research*, 61, 243–253.
- Vollm, B., Richardson, P., McKie, S., Elliot, R., Deakin, J., & Anderson, I. M. (2006). Serotonergic modulation of neuronal responses to behavioural inhibition and reinforcing stimuli: An fMRI study in healthy volunteers. *European Journal of Neuroscience*, 23, 552–560.
- Vucetic, Z., Totoki, K., Schoch, H., Whitaker, K. W., Hill-Smith, T., Lucki, I., et al. (2010). Early life protein restriction alters dopamine circuitry. *Neurosci*ence, 168, 359–370.
- White, S. F., Brislin, S., Sinclair, S., Fowler, K. A., Pope, K., & Blair, R. J. (2013). The relationship between large cavum septum pellucidum and antisocial behavior, callous–unemotional traits and psychopathy in adolescents. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 54, 575–581.
- Woermann, F. G., van Elst, L. T., Koepp, M. J., Free, S. L., Thompson, P. J., Trimble, M. R., et al. (2000). Reduction of frontal neocortical grey matter associated with affective aggression in patients with temporal lobe epilepsy: An objective voxel by voxel analysis of automatically segmented MRI. Journal of Neurology, Neurosurgery, and Psychiatry, 68, 162–169.
- Wong, M. T., Fenwick, P. B., Lumsden, J., Fenton, G. W., Maisey, M. N., Lewis, P., et al. (1997). Positron emission tomography in male violent offenders with schizophrenia. *Psychiatry Research*, 68, 111–123.
- Yang, Y., Joshi, A. A., Joshi, S. H., Baker, L. A., Narr, K. L., Raine, A., et al. (2012). Genetic and environmental influences on cortical thickness among 14-yearold twins. *NeuroReport*, 23, 702–706.
- Yang, Y., Phillips, O. R., Kan, E., Sulik, K. K., Mattson,

S. N., Riley, E. P., et al. (2012). Callosal thickness reductions relate to facial dysmorphology in fetal alcohol spectrum disorders. *Alcoholism: Clinical and Experimental Research*, 36, 798–806.

- Yang, Y., & Raine, A. (2009). Prefrontal structural and functional brain imaging findings in antisocial, violent, and psychopathic individuals: A meta-analysis. *Psychiatry Research*, 174, 81–88.
- Yang, Y., Raine, A., Colletti, P., Toga, A. W., & Narr, K. L. (2009). Abnormal temporal and prefrontal cortical gray matter thinning in psychopaths. *Molecular Psychiatry*, 14, 555, 561–562.
- Yang, Y., Raine, A., Colletti, P., Toga, A. W., & Narr, K. L. (2010). Morphological alterations in the prefrontal cortex and the amygdala in unsuccessful psychopaths. Journal of Abnormal Psychology, 119, 546–554.
- Yang, Y., Raine, A., Colletti, P., Toga, A. W., & Narr, K. L. (2011). Abnormal structural correlates of response perseveration in individuals with psychopathy. *Journal of Neuropsychiatry and Clinical Neurosciences*, 23, 107–110.
- Yang, Y., Raine, A., Joshi, A. A., Joshi, S., Chang, Y. T., Schug, R. A., et al. (2012). Frontal information flow and connectivity in psychopathy. *British Journal* of *Psychiatry*, 201, 408–409.
- Yang, Y., Raine, A., Lencz, T., Bihrle, S., LaCasse, L., & Colletti, P. (2005a). Prefrontal white matter in pathological liars. *British Journal of Psychiatry*, 187, 320–325.
- Yang, Y., Raine, A., Lencz, T., Bihrle, S., LaCasse, L., & Colletti, P. (2005b). Volume reduction in prefrontal gray matter in unsuccessful criminal psychopaths. *Biological Psychiatry*, 57, 1103–1108.
- Yang, Y., Raine, A., Narr, K. L., Colletti, P., & Toga, A. W. (2009). Localization of deformations within the amygdala in individuals with psychopathy. Archives of General Psychiatry, 66, 986–994.
- Yang, Y., Raine, A., Narr, K. L., Lencz, T., LaCasse, L., Colletti, P., et al. (2007). Localisation of increased prefrontal white matter in pathological liars. *British Journal of Psychiatry*, 190, 174–175.
- Yau, S. Y., Gil-Mohapel, J., Christie, B. R., & So, K. F. (2014). Physical exercise-induced adult neurogenesis: A good strategy to prevent cognitive decline in neurodegenerative diseases? *BioMed Research International*, 2014, Article ID 403120.
- Zuckerman, M. (1990). The psychophysiology of sensation seeking. Journal of Personality, 58, 313–345.

## CHAPTER 17

# Psychopathy and Brain Function Insights from Neuroimaging Research

R. JAMES R. BLAIR HARMA MEFFERT SOONJO HWANG STUART F. WHITE

his early part of the 21st century is a particularly interesting time to be a cognitive neuroscientist working to understand psychiatric disorders given the emergence of the National Institute of Mental Health's Research Domain Criteria (NIMH RDoC) framework. The RDoC project is "designed to implement Strategy 1.4 of the NIMH Strategic Plan: Develop, for research purposes, new ways of classifying mental disorders based on dimensions of observable behavior and neurobiological measures." The effort is to define basic dimensions of functioning (e.g., fear circuitry) to be studied across multiple units of analysis, from genes to neural circuits to behaviors, cutting across disorders as traditionally defined. The RDoC framework can be considered to place cognitive neuroscience at the center of the understanding of psychiatric disorders. The project can be conceptualized as the search to identify neurocognitive systems that subserve specific functions in healthy individuals and which, when perturbed, give rise to specific patterns of impairment.

In this chapter, to provide understanding of psychopathy from a neuroscientific perspective, we consider five broad dimensions of functioning: empathy, attention, acute threat response, reinforcement-based decision making, and response control. (It should be noted that most of these have subdimensions, which we will mention when necessary.) We argue that only one of these functions, "empathy," relates to psychopathy specifically. The others, we argue, either characterize individuals at elevated risk for reactive aggression (acute threat response) or individuals with psychopathy or other conditions associated with externalizing behavior such as attention-deficit/hyperactivity disorder (ADHD) and substance abuse (reinforcement-based decision making, attention, and response control).

There are two main accounts of the neurobiology of psychopathic traits: Kiehl's paralimbic hypothesis (Anderson & Kiehl, 2012; Kiehl, 2006) and Blair's (2007, 2013) integrated emotion systems approach. While the integrated emotion systems approach stresses dimensions of functioning and the neural systems that mediate these dimensions, the core of the paralimbic hypothesis is an anatomy-based claim. We briefly consider the paralimbic hypothesis before we discuss the dimensions of functioning stressed by the integrated emotion systems approach.

## The Paralimbic Hypothesis

Kiehl (2006) makes reference to work by neuroanatomists, who have grouped the anterior superior temporal gyrus (temporal pole), rostral and caudal anterior cingulate, posterior cingulate, orbitofrontal cortex, insula, and parahippocampal regions into what can be termed the "paralimbic cortex" (Brodmann, 1909; Mesulam, 2000). Because the cortical, basolateral nuclei of the amygdala "often extend into the paralimbic areas, blurring the boundaries between limbic and paralimbic regions," Kiehl (2006, p. 122 [citing Mesulam, 2000]) also considers this region part of the paralimbic system. The suggestion is that the regions included in the paralimbic system are all disrupted in psychopathy (Anderson & Kiehl, 2012; Kiehl, 2006). These cortical features of the amygdala often extend into the paralimbic areas, blurring the boundaries between limbic and paralimbic regions.

The structural MRI (sMRI) literature has been particularly useful with respect to the paralimbic system model. However, as with the functional MRI (fMRI) literature, it always pays to be cautious when considering the data. In particular, the nature of the comparison samples sometimes needs attention. For example, a recent sMRI study reported a 30% reduction across most of the cortex in adults with psychopathy relative to healthy comparison individuals (Boccardi et al., 2011). However, the IQ and the substance dependence rates of the healthy comparison individuals were not reported. This is unfortunate because, given the job descriptions of the healthy comparison individuals (students, hospital staff, and skilled workers), their average IQs were likely significantly higher and average substance dependence rates significantly lower than those of the clinical participants. These confounds likely explain the findings: When Boccardi and colleagues (2011) contrasted participants high in psychopathy against IQ-matched low-psychopathy controls, very minimal differences in cortical volume were seen.

However, important differences in brain structure have been identified in other work comparing high-psychopathy groups with different comparison groups. Studies focusing on adults with psychopathy (Ermer, Cope, Nyalakanti, Calhoun, & Kiehl, 2012; Yang, Raine, Narr, Colletti, & Toga, 2009, 2010), youth with psychopathic traits (Ermer, Cope, Nyalakanti, Calhoun, & Kiehl, 2013; Wallace et al., 2014), and youth with conduct disorder (Fairchild et al., 2011, 2013; Huebner et al., 2008; Sterzer, Stadler, Poustka, & Kleinschmidt, 2007) have quite consistently reported reduced amygdala volumes in clinical participants relative to comparison populations. In addition, four studies have reported reductions in temporal pole volume (Ermer et al., 2012; Gregory et al., 2012; Ly et al., 2012; Yang, Raine, Colletti, et al., 2009), and two others, reductions in superior temporal sulcus volume (de Oliveira-Souza et al., 2008; Yang, Raine, Colletti, et al., 2009) among adults with psychopathy, while reductions in volume of temporal cortex (Fairchild et al., 2011; Huebner et al., 2008; Krusei, Casanova, Mannheim, & Johnson-Bilder, 2004) and thickness (Hyatt, Haney-Caron, & Stevens, 2012) have been reported in youth exhibiting conduct problems in conjunction with psychopathic traits (Ermer et al., 2013; Wallace et al., 2014). Three studies have reported reductions in volume in orbitofrontal cortex in adults with psychopathy (de Oliveira-Souza et al., 2008; Ermer et al., 2012; Yang, Raine, Colletti, et al., 2009) but the literature with respect to this region in youth samples has been rather mixed. Reductions in volume (Ermer et al., 2013; Huebner et al., 2008; Wallace et al., 2014) and cortical thickness (Fahim et al., 2011) or folding (Hyatt et al., 2012) in this area have been reported in some studies but not in others (Dalwani et al., 2011; De Brito et al., 2009; Fairchild et al., 2011, 2013; Sterzer et al., 2007). Studies focusing on youth with conduct disorder have relatively consistently reported reductions in the volume (Fairchild et al., 2011; Sterzer et al., 2007), thickness (Fahim et al., 2011), or folding (Hyatt et al., 2012) of insula cortex. However, it should be noted that no relationships for reductions in these regions with psychopathic traits have been reported in youth (De Brito et al., 2009; Ermer et al., 2013; Wallace et al., 2014), and studies of adults with psychopathic traits have also reported no reductions in insula volume (Ermer et al., 2012). The literature is even more mixed with respect to dorsomedial prefrontal cortex. Some studies of youth with conduct disorder have reported structural reductions in this region (Fahim et al., 2011; Fairchild et al., 2011; Hyatt et al., 2012), but others have not (Dalwani et al., 2011; Huebner et al., 2008; Sterzer et al., 2007), and no relationship with psychopathic traits has been found in either adult or child samples (Ermer et al., 2012, 2013; Wallace et al., 2014).

Given the findings of structural abnormalities within the amygdala and ventromedial frontal cortex, several studies have investigated the structural integrity of the uncinate fasciculus, the white-matter tract that connects the amygdala to the frontal lobe. Interestingly, adults with psychopathic traits have been reported to show reduced functional anisotropy of this white-matter tract (Craig et al., 2009; Motzkin, Newman, Kiehl, & Koenigs, 2011; Sundram et al., 2012). However, studies with youth samples have reported either no fractional anisotropy difference in the uncinate fasciculus for adolescents with psychopathic traits compared to control youths (Finger et al., 2012), or *increased* fractional anisotropy in youth with conduct disorder (Passamonti et al., 2012; Sarkar et al., 2013). These diverging findings may reflect the developmental progression of psychopathy, sample differences (e.g., less severe cases in some studies relative to others), or the impact of other socioenvironmental factors in the adult samples (e.g., opiate use).

In summary, the paralimbic model of psychopathy predicts abnormalities in regions other than the amygdala, including the ventromedial prefrontal cortex and striatum, based on cytoarchitectonic similarities. In particular, the findings of temporal cortex reductions in youth and adults with psychopathy (de Oliveira-Souza et al., 2008; Ermer et al., 2012, 2013; Gregory et al., 2012; Ly et al., 2012; Wallace et al., 2014; Yang, Raine, Colletti, et al., 2009) are predicted by the paralimbic system model. In contrast, Blair's (2007) neurocognitive model posits that reductions in this region are a secondary developmental consequence of the core impairments in the amygdala and ventromedial frontal cortex that characterize psychopathy.

It is also worth noting that the sMRI findings fail to provide support for other core predictions of the paralimbic model. In particular, the model suggests that insula and anterior cingulate cortex should be compromised, but the sMRI findings fail to support this (Ermer et al., 2012, 2013; Wallace et al., 2014). It could be argued that the impairments within these regions only show up in fMRI studies (Ermer et al., 2013). However, the difficulty with this argument is this: What does it mean for the model that one region appears structurally intact but with functions impaired, while other regions, with apparently the same cytoarchitectonic properties, show structural abnormalities but functional sparing?

In addition, available data indicate that individuals with psychopathy do not show dysfunction in several of the regions implicated in the paralimbic hypothesis, including the hippocampus. The hippocampus is critical for episodic memory and spatial processing, but neither of these functions appear compromised in individuals with psychopathy (though they do show a failure in the impact of emotional material on memory; Christianson et al., 1996). Another difficulty for the paralimbic model is that core functions of the

anterior cingulate cortex (conflict monitoring) and superior temporal cortex and temporal pole (theory of mind) are not impaired in individuals with psychopathic traits (Blair et al., 1996; Buitelaar, Van der Wees, Swabb-Barneveld, & Van der Gaag, 1999; Hiatt, Schmitt, & Newman, 2004). The question thus arises as to why these brain regions show reduced gray-matter volume but apparently preserved functional integrity in individuals with psychopathy. One possible answer is that the gray-matter reduction in these regions is a developmental consequence of reduced input from regions such as the amygdala that are dysfunctional in psychopathy (Blair, 2007). A second possibility is that other functions of these regions are dysfunctional (though these will need to be specified). Either possibility suggests that the paralimbic hypothesis requires further elaboration and refinement.

## The Integrated Emotion Systems Account

As noted earlier, the integrated emotion systems approach (Blair, 2007, 2013) stresses dimensions of functioning. Within this chapter, the dimensions to be considered are empathy attention, acute threat responding, reinforcement-based decision making, and response control. The sections that follow provide coverage of each of these in turn.

## Empathy

The term "empathy" subsumes two critical processes that are distinct at both the psychological process and the neural systems levels (Blair, 2005): cognitive and emotional empathy.

## Cognitive Empathy

Cognitive empathy involves internal representation of the intentions and thoughts of other individuals, and as such, is also known as either mentalizing or theory of mind (Frith, 1989)—though it should be noted that the term "theory of mind" has been used relatively loosely in recent writings to cover a range of cognitive–affective processes. Recent neuroimaging research has implicated the temporal pole, superior temporal cortex, posterior cingulate cortex, and rostral medial frontal cortex in cognitive empathy (Happé & Frith, 2014; Kennedy & Adolphs, 2012). Most studies report that cognitive empathy/mentalizing is not impaired in adults or children with psychopathic traits (Blair et al., 1996) or children with conduct disorder more generally (Buitelaar et al., 1999). Moreover, the neural regions implicated in mentalizing (temporal pole, superior temporal cortex, posterior cingulate cortex, and rostral medial frontal cortex) show appropriate recruitment in youth with conduct problems and elevated callous–unemotional (CU) traits during mentalizing tasks (Sebastian et al., 2012).

#### Emotional Empathy

Emotional empathy (see Figure 17.1) can be evoked by facial cues, auditory cues, body postures, and even text stimuli (Blair, 2006). It has been argued that emotional cues have a communicative function: They impart specific information to the observer (Blair, 2003; Fridlund, 1992), and emotional empathy is the observer's "translation" of this communication. It has been argued that different facial expressions provide different communicatory signals, initiate different forms of reinforcement-based learning, and are processed by neural systems that are at least partially distinct (Blair, 2003).

The emotional empathy impairment in youths (and adults) with psychopathic traits appears to be selective. For example, they have normal recognition of expressions of anger or disgust (see, for meta-analytic reviews of the literature, Dawel, O'Kearney, McKone, & Palermo, 2012; Marsh & Blair, 2008), and their blood oxygen level-dependent (BOLD) responses to angry expressions are similar to those of typically developing adolescents (Carré, Hyde, Neumann, Viding, & Hariri, 2013; Marsh et al., 2008; White, Williams, et al., 2012), though their responsiveness to disgust expressions remains to be tested. In contrast, youth high in psychopathic traits show impairment in the recognition of fearful, sad, and happy expressions (Dawel et al., 2012; Marsh & Blair, 2008). Impaired recognition of fearfulness and sadness has been shown for vocal tones (R. J. R. Blair, Budhani, Colledge, & Scott, 2005; Stevens, Charman, & Blair, 2001) and body postures (Muñoz, 2009).

It has been argued that emotional expressions are social reinforcers (Blair, 2003), which means that representations of actions and objects associated with these expressions possess acquired value. Socialization can occur through stimulus-rein-



**Temporal cortex** 

**FIGURE 17.1.** Systems important for emotional empathy. The amygdala is critical for learning the value of objects and the value of representations of actions from the emotional displays of others. Priming, by the amygdala, of temporal cortical representations of emotional stimuli, including distress cues, heightens attention toward emotional stimuli. Priming, by the amygdala, of parietal cortical representations of the spatial locations of emotional stimuli, including distress cues, potentially via the posterior cingulate cortex, directs attention to the location of emotional stimuli. Feeding forward of reinforcement expectancy information to the ventrome-dial frontal cortex allows decision making on the basis of this value information, including moral judgment.

forcement-based social referencing (Blair, 2013), in which an individual learns to value a stimulus through observation of other individuals' emotional reactions to it. For example, the developing child learns that objects or conceptual representations of actions (e.g., "hitting your brother") that elicit another individual's fear or distress are bad and to be avoided (Klinnert, Emde, Butterfield, & Campos, 1987). Considerable data have demonstrated that the amygdala is critical for stimulusreinforcement learning (Sears, Schiff, & LeDoux, 2014). Moreover, animal work has shown that social referencing is disrupted by amygdala damage (Jeon et al., 2010), and recent fMRI work has implicated the amygdala in social referencing in humans also (Meffert, Brislin, White, & Blair, 2015).

Core emotional cues for expression-based stimulus-reinforcement-mediated socialization include distress cues in the form of fearful, sad, and pained facial expressions, and also happy expressions. Considerable work shows that the amygdala responds to distress cues, particularly fearful expressions (Murphy, Nimmo-Smith, & Lawrence, 2003) but also sad expressions and displays of pain in others (R. J. R. Blair, Morris, Frith, Perrett, & Dolan, 1999; Lamm, Decety, & Singer, 2011). Objects and semantic representations of actions associated with distress cues tend to be regarded as aversive, and those with happy expressions, appetitive. On the basis of recent fMRI work, this differential affective valuation appears to reflect a role for the amygdala in sensitivity to prediction errors for expressions (i.e., the degree to which the expression induced by an object deviates from the expected emotional reaction) and presumably learning as a function of these prediction errors (Meffert et al., 2015); that is, the greater the unexpectedness of another person's emotional reaction, the greater the prediction error-with learning occurring as a function of prediction error magnitude, such that greater learning (a greater change in the value associated with the object) occurs in response to greater prediction errors (Rescorla & Wagner, 1972).

Individuals with psychopathic traits show reduced amygdala responses to distress cues. For example, adolescents high in psychopathic traits show reduced amygdala responses to fearful relative to neutral expressions (Jones, Laurens, Herba, Barker, & Viding, 2009; Lozier, Cardinale, Van-Meter, & Marsh, 2014; Marsh et al., 2008; Viding et al., 2012; White, Marsh, et al., 2012). Adults with psychopathic traits also show a reduction in amygdala reactivity to fearful relative to neutral expressions compared to low-psychopathy controls (Decety, Skelly, Yoder, & Kiehl, 2014; Dolan & Fullam, 2009). However, group differences in amygdala response have not been found in studies in which the comparison group failed to show enhanced amygdala response to fearful relative to neutral expressions (e.g., Deeley et al., 2006; Pardini & Phillips, 2010). Individuals with psychopathy also show reduced amygdala responses during stimulus-reinforcement-based aversive conditioning more generally (Birbaumer et al., 2005).

In healthy individuals, amygdala activation by distress cues leads to increased arousal via projections to the brainstem. Consistent with the suggestion of amygdala dysfunction, youth and adults with psychopathic traits show reduced autonomic reactivity to fearful and sad expressions and pain displayed by other individuals, as well as atypical electroencephalographic (EEG) responses to others' pain (Anastassiou-Hadjicharalambous & Warden, 2008; Aniskiewicz, 1979; R. J. R. Blair, 1999; Cheng, Hung, & Decety, 2012; de Wied, van Boxtel, Matthys, & Meeus, 2012).

In healthy individuals, amygdala activation by distress cues leads to increased attention to these cues. This increased attention reflects the reciprocal connections between the amygdala and temporal/visual cortex, such that the amygdala stimulates neurons in the temporal cortex that represent the emotionally salient features of the eliciting cue, further strengthening the representation of these features and increasing the probability that they will "win" the competition for representation (Pessoa, Kastner, & Ungerleider, 2002). In addition, the amygdala can prime information within parietal cortex via its connections with posterior cingulate cortex (Luo et al., 2009; McCoy & Platt, 2005). Consistent with the idea of amygdala dysfunction, youth and adults with psychopathic traits show reduced temporal cortical responses to distress cues (Deeley et al., 2006; Marsh et al., 2008).

In the case of fearful expressions, the eye region is a particularly emotionally salient feature (Adolphs et al., 2005). Indeed, it is critical for the eye region to be processed when interpreting another individual's emotional expression. Specifically, it is crucial that the observer represent what the expresser is responding to in order for any transfer of valence information to occur in social referencing tasks (cf. Meffert et al., 2015). It appears that representation of a fearful expression is particularly strengthened when the individual attends to the eye region. Patients with amygdala lesions, such as individuals with psychopathic traits, show impaired fearful expression recognition (Adolphs et al., 2005). Strikingly, orienting the attention of patients with amygdala lesions, or individuals with psychopathic traits, to the eye region reduces or removes the impairment in fearful expression recognition (Adolphs et al., 2005; Dadds, El Masry, Wimalaweera, & Guastella, 2008; Dadds et al., 2006). Other techniques for increasing emotional salience, such as increasing the intensity of an expression through graded modification ("morphing"), can also reduce group differences in fearful expression recognition (Blair, Colledge, Murray, & Mitchell, 2001).

Related to the foregoing evidence, there have been suggestions that the impairment in processing distress cues seen in individuals with psychopathic traits is secondary to an impairment in processing information from the eye region (Dadds, Jambrak, Pasalich, Hawes, & Brennan, 2011). However, it should be noted that impairment in the recognition of fearful expressions is seen even if the expressions are presented too rapidly for eye gaze to have an influence on recognition accuracy (Jusyte, Mayer, Kunzel, Hautzinger, & Schonenberg, 2015; Sylvers, Brennan, & Lilienfeld, 2011). Moreover, the reduced amygdala response is seen even if the expression is presented too rapidly for attention to the eye region to have an influence on BOLD response (Viding et al., 2012). In addition, it should also be noted that there have been reports that dysfunction in the response to eye gaze information is only seen if the expresser is displaying fear, not if he or she is displaying anger (White, Williams, et al., 2012). As such, it is more likely that a primary deficit in emotional responding reduces attention to core emotional stimulus features of the face, such as the eyes.

Appropriate empathic responding is critical for harm-based moral development, for example, for learning to view harm-oriented transgressions (e.g., hitting another) as "bad." It has been argued that harm-based judgments are reliant on the amygdala transmitting reinforcement expectancy information to the ventromedial frontal cortex (Blair, 2013). Published studies have demonstrated impairments in moral judgment in youth and adults with psychopathic traits (Blair, 1995, 1997; Koenigs, Kruepke, Zeier, & Newman, 2012), and other work has shown that high-psychopathy youth and adults show reduced amygdala and/ or ventromedial prefrontal cortex activity, along with reduced amygdala-ventromedial frontal-prefrontal cortex connectivity, when making carebased moral judgments (Glenn, Raine, & Schug, 2008; Harenski, Harenski, Shane, & Kiehl, 2010; Marsh et al., 2011). In addition, (1) youth and adults with psychopathic traits are less likely to judge harm-based transgressions as wrong because they hurt others (Blair, 1995, 1997), and children with higher CU traits state that they are less concerned, relative to children with low CU traits, that aggressive behavior will result in suffering in the victim (Pardini & Byrd, 2012) and (2) high-psychopathy individuals show weaker positive covariation between amygdala activity and severity ratings of transgressions compared to healthy controls (Harenski et al., 2010).

#### The Case of Others' Pain

A series of studies has identified a network of brain regions that respond to the sight of another individual in pain (see Figure 17.2). This "pain matrix" implicates somewhat different regions than those identified in the process of learning from emotional expressions described earlier, though there is some overlap. The pain matrix includes the supplementary motor area, dorsal anterior cingulate cortex, anterior medial anterior cingulate cortex, anterior insula cortex, amygdala, and periaqueductal gray (for a meta-analytic review of this literature, see Lamm et al., 2011). It has been argued that the anterior cingulate cortex and anterior insula cortex are involved in the "affective-motivational component; i.e., the evaluation of subjective discomfort in the context of painful or aversive stimuli" (Decety, 2011, p. 40). In addition, the anterior insula "is involved in processing associated with each system, including sensory coding, body state assessment, and autonomic regulations, as well as emotional valence coding of sensory events. The cingulate cortex mediates the three aspects of pain processing that may use affect regulation but is explicitly involved in avoidance/nocifensive behaviors" (p. 40).

It has been known for some time that individuals high in psychopathy show reduced emotional (autonomic) responses to the sight of other individuals in apparent pain (Aniskiewicz, 1979; House & Milligan, 1976). Recent fMRI work has examined the neural basis of this dysfunction in youthful or adult participants with psychopathic traits (Decety, Chen, Harenski, & Kiehl, 2013; Decety, Skelly, & Kiehl, 2013; Lockwood et al., 2013; Marsh et al., 2013), or youth with conduct disorder (Decety, Michalska, Akitsuki, & Lahey, 2009). With respect to the pain matrix, studies in



**FIGURE 17.2.** Systems involved in the affective–motivational component of the response to the pain of others (i.e., the evaluation of subjective discomfort in the context of painful or aversive stimuli; Decety, 2011).

youth have reported that observing others in pain is associated with reduced activity within rostral medial/anterior cingulate cortex (Lockwood et al., 2013; Marsh et al., 2013; Meffert, Gazzola, den Boer, Bartels, & Keysers, 2013), the amygdala (Decety, Chen, et al., 2013; Marsh et al., 2013), and anterior insula cortex (Decety, Chen, et al., 2013; Lockwood et al., 2013; Meffert et al., 2013). In these studies, level of activity within these regions related inversely to CU traits in the child samples (Lockwood et al., 2013; Marsh et al., 2013) and to affective–interpersonal (Factor 1) features of psychopathy in adults (Decety, Chen, et al., 2013).

Beyond the pain matrix, two studies have reported reduced activity within lateral orbitofrontal cortex in adults with psychopathic traits or children with conduct disorder when observing the pain of others (Decety et al., 2009; Decety, Skelly, & Kiehl, 2013). However, it should be noted that for each of these regions, at least three of the existing studies did *not* detect group differences. Moreover, strikingly, with respect to anterior insula cortex, two studies have actually reported increased activity in adults with psychopathic traits and children with conduct disorder compared to control participants when observing the pain of others (Decety et al., 2009; Decety, Skelly, & Kiehl, 2013), and a third reported increased activity in this region in adults with psychopathic traits when imagining a painful event as occurring to the self (Decety, Skelly, & Kiehl, 2013).

## Attention

An attention-based view on psychopathy that has been influential for some time is the response modulation hypothesis (Patterson & Newman, 1993; see also Hamilton & Newman, Chapter 4, this volume). According to this model, individuals with psychopathy show problems inhibiting maladaptive behavior because they fail to reallocate attention away from goal-relevant task stimuli toward salient but task-irrelevant stimuli. From this viewpoint, impairment in emotional processing in psychopathy does not reflect a primary deficit in emotional sensitivity or responsiveness, but rather a secondary consequence of heightened attention to goal-relevant stimuli (Baskin-Sommers, Curtin, & Newman, 2011).

Figure 17.3 depicts a simplified version of the classic cognitive view on attention. The suggestion is that the representations of stimuli are mutually inhibitory, and stimuli that are attended to are those that win the process of representational competition resulting from this mutual inhibition (Desimone & Duncan, 1995). The representation

Top-down attentional control (DLPFC, parietal cortex) Stimulus A (task relevant)

**FIGURE 17.3.** A simplified view of attention. Two sensory representations (circles) are depicted as mutually inhibitory. Systems involved in top-down attention prime one of these representations such that it increases in activity (represented by size of circle), inhibiting the other representation.

of particular stimuli can be primed to win this competition. This can occur because of the intrinsic features of the stimuli; for example, moving stimuli are represented more strongly and are more likely to be attended to than stationary stimuli (socalled "bottom-up attention"; Miller & Buschman, 2013). Alternatively, enhanced competitiveness of stimuli may occur via the priming of task-relevant representations by the lateral frontal cortex ("topdown attention"; Miller & Buschman, 2013). In this case, priming of task-relevant stimuli by the lateral frontal cortex should result in reduced representation of non-task-relevant affective features of the environment (via inhibition from the primed task-relevant representations). This in turn should result in reduced emotional responses to these affective features. In line with this, considerable data show that in healthy individuals, attending to task-relevant stimuli is associated with increased activity within lateral frontal and parietal cortices and reduced amygdala reactivity to emotional distracters (K. S. Blair et al., 2007; Mitchell et al., 2007, 2008).

From this perspective, one may arague that psychopathy represents a disorder with heightened top-down attention to goal-directed stimuli, leading to weaker representation of, and responsiveness to, emotional stimuli (cf. R. J. R. Blair & Mitchell, 2009; Larson et al., 2013). In line with this view, Larson and colleagues (2013) reported that "decreased amygdala activity was observed in psychopathic offenders only when attention was engaged in an alternative goal-relevant task prior to presenting threat-relevant information. Under this condition, psychopaths also exhibited greater activation in selective-attention regions of the lateral prefrontal cortex (LPFC) than did nonpsychopaths" (p. 757).

However, there are two reasons for caution in interpreting these results. First, in three of the four stimulus conditions, the comparison adults showed *decreased* amygdala response during threat relative to safe trials (in the fourth, there was no difference between these trial types). Given this, it is difficult to conclude that individuals with psychopathy failed to show an amygdala response in early alternative focus trials or showed an appropriate amygdala response in other trial types when healthy individuals did not show this response.

Second, the response modulation hypothesis predicts that reduced amygdala responses to affective stimuli occur because top-down attention systems are priming the representation of nonemotional stimulus features. In line with this, Larson and colleagues (2013) reported increased activation within the lateral frontal cortex in individuals with psychopathic traits in the experimental condition associated with reduced amygdala responses in this group. However, a large number of studies report reduced amygdala responses to negative stimuli in adults and children with psychopathic traits, CU traits, and conduct disorder more generally (e.g., Birbaumer et al., 2005; Decety, Skelly, & Kiehl, 2013; Harenski et al., 2010; Hwang et al., 2016; Jones et al., 2009; Kiehl et al., 2001; Lockwood et al., 2013; Lozier et al., 2014; Marsh et al., 2008, 2013; Sterzer, Stadler, Krebs, Kleinschmidt, & Poustka, 2005; Viding et al., 2012; White, Marsh, et al., 2012). These studies do not report increased activity in the lateral frontal cortex in clinical relative to the comparison participants in conditions in which reduced amygdala response is observed.

Given these concerns, it appears unlikely that the reduced emotional responses seen in psychopathy can be attributed to heightened top-down attention. However, this does not mean that attention is unimportant. As noted earlier, work with healthy participants has shown that attention to task features reduces amygdala response to emotional distracters (K. S. Blair et al., 2007; Mitchell et al., 2007, 2008). In addition, attention toward or away from emotional features regulates amygdala responses. Thus, regions of top-down attention are implicated in both the down- and the up-regulation of emotional (amygdala) responses to aversive images by cognitive reappraisal (Ochsner et al., 2004). Findings reviewed above have demonstrated that increasing attention to the eye region of fearful expressions enhanced the recognition of these expressions in youth with CU traits (Dadds et al., 2006, 2008). There are also data that suggest task manipulations that increase attention to affective features of the stimulus may "normalize" the reduced emotional response typically shown by individuals with psychopathic traits. For example, instructions to "feel with the receiving (50%) or the approaching (50%) hand" abolished the reduced anterior insula responses seen in individuals with psychopathy when viewing affected related hand exchanges between anonymous individuals (Meffert et al., 2013). These findings suggest that appropriate emotional responding may be seen in individuals with psychopathy following a sufficiently intense stimulus induced by top-down attention. However, further work is needed to replicate these findings and assess the attentional parameters associated with this normalization.

#### Acute Threat Response

Mammalian species show a gradated response to threat, progressing from freezing to flight to reactive aggression (active striking out in response to threat/frustration) as the threat grows more proximal (Blanchard, Blanchard, & Takahashi, 1977). This progression of response is mediated by the amygdala and its connections through hypothalamus to the periaqueductal gray (see Figure 17.4). As has been shown in animal studies (Gregg & Siegel, 2001; Panksepp, 1998) and more recently in fMRI work with humans (Coker-Appiah et al., 2013; Mobbs et al., 2007, 2009, 2010), the more proximal the threat, the greater the activity within this system and the more likely that reactive aggression will be exhibited in response to the threat. Notably, the suggestion that these systems mediate reactive aggression to frustrating stimuli (Blair, 2004) has also received empirical support (Yu, Mobbs, Seymour, Rowe, & Calder, 2014).

Systems mediating top-down attention (lateral and dorsomedial frontal cortex; K. S. Blair et al., 2007; R. J. R. Blair & Mitchell, 2009; Buhle et al., 2014; Pessoa & Ungerleider, 2004) can regulate the threat response. This regulation can occur "automatically": For example, task demands requiring top-down attention prime the representation of task relevant stimuli and consequently in-



**FIGURE 17.4.** Systems involved in the acute threat response (Gregg & Siegel, 2001; Panksepp, 1998).

hibit the representation of emotional "distracter" information through representational competition (K. S. Blair et al., 2007, 2013). This regulation can also be "controlled": For example, reappraisal paradigms that require the participant to represent an emotional stimulus differently appear to work via top-down attentional priming of alternative, nonemotional representations of the stimulus array, such that the representation of emotional information is inhibited following representational competition (Buhle et al., 2014). It has also been argued that amygdala responding may be regulated via the ventral anterior cingulate cortex (vACC), supporting a form of emotional conflict adaptation (Gyurak, Gross, & Etkin, 2011).

In short, the probability of reactive aggression is increased if the threat is sufficiently intense (or is at least processed as if it is sufficiently intense) and/or systems responsible for the regulation of the basic threat response are dysfunctional. Heightened threat sensitivity is not seen in individuals with psychopathy. However, it is argued that it is seen in a subgroup of individuals at increased risk for antisocial behavior who show low psychopathic traits (Crowe & Blair, 2008). Heightened threat sensitivity likely underpins the development of hostile attribution biases that further increase the risk for reactive aggression (Dodge, Lochman, Harnish, Bates, & Pettit, 1997; Dodge, Pettit, Bates, & Valente, 1995; Lopez-Duran, Olson, Hajal, Felt, & Vazquez, 2009). In support of the suggestion that heightened threat sensitivity may be seen in antisocial individuals with low psychopathic traits, several recent studies have shown that youth with conduct problems who are low in CU traits show increased amygdala reactivity to social threats (e.g., Viding et al., 2012). Moreover, several psychiatric conditions with a particularly marked increased risk for reactive aggression (e.g., intermittent explosive disorder, borderline personality disorder; Coccaro, McCloskey, Fitzgerald, & Phan, 2007; New et al., 2009) also show enhanced amygdala responsiveness to threatening stimuli (Coccaro et al., 2007; Lee, Chan, & Raine, 2008; New et al., 2009).

#### **Reinforcement-Based Decision Making**

There is a considerable animal and human research literature on the topic of reinforcement-based decision making. An adequate review of this literature is beyond the scope of this chapter. However, useful recent reviews are available (O'Doherty, 2012; Rangel & Clithero, 2012; Schoenbaum, Takahashi, Liu, & McDannald, 2011). We concentrate here on the literature of most relevance to our current understanding of psychopathy. In brief, response-outcome learning is an important process underlying the ability for reinforcementbased decision making. The striatum (including the caudate nucleus; see Figure 17.5, upper portion) is thought to be critical for this type of learning. In a situation in which the individual is choosing whether to make a response associated with a particular valued outcome, reinforcement expectancy information provided by the striatum on the basis of prior learning is critical. The striatum is also critical for prediction error signaling (signaling the difference between the amount of reward or punishment received and the amount expected; Dayan & Balleine, 2002; O'Doherty, 2012). Prediction error signals are thought to spur reinforcement learning. The greater the prediction error, the greater the alteration in the reinforcement associated with the stimulus (Rescorla & Wagner, 1972).

The ventromedial prefrontal cortex (Figure 17.5, lower portion) represents reinforcement expectancies—either following prior stimulus–reinforcement or stimulus–response association for-



**FIGURE 17.5.** Systems involved in stimulus–reinforcement-based decision-making. The caudate is critical for prediction errors, while the ventromedial frontal cortex is critical for the representation of expected value.

mation (i.e., the subjective or expected value of a stimulus or potential response; O'Doherty, 2012). The individual approaches objects and initiates actions that are associated with positive reinforcement expectancies. If more than one response/ object is available, the ventromedial prefrontal cortex represents the values associated with these different responses/objects, but the dorsomedial frontal cortex responds to the "conflict" associated with the different responses/objects (K. S. Blair et al., 2006). This conflict activates attentional resources, via lateral frontal and parietal cortices, and response control resources, via inferior frontal cortex and anterior insula cortex, so that the optimal response can be selected (Budhani, Marsh, Pine, & Blair, 2007).

In addition to the role of the striatum and ventromedial prefrontal cortex working together and in conjunction with other regions to achieve instrumental choices (O'Doherty, 2012), there also appears to be a role for the anterior insula cortex, dorsomedial frontal cortex, and striatum in avoidance behavior (Budhani et al., 2007; Casey et al., 2001; Kuhnen & Knutson, 2005; Liu et al., 2007). These regions—particularly the anterior insula cortex and dorsomedial frontal cortex show greater activity when suboptimal choices are about to made, and activity within these regions is modulated by expected value (Kuhnen & Knutson, 2005; White, Pope, et al., 2013).

There are suggestions of dysfunction in reinforcement-based decision making in individuals with psychopathy. However, that dysfunction might be manifested as (1) heightened reward sensitivity, (2) reduced reward sensitivity, (3) dysfunctional processing of punishment, or (4) impaired avoidance responses. Each of these possibilities is addressed in the points that follow.

1. It could be argued that higher reward sensitivity should be associated with greater rewardseeking behavior, and consequently reduced processing of potential costs, resulting in an increased risk for antisocial behavior (Bjork, Chen, & Hommer, 2012; Buckholtz et al., 2010). In line with this, there have been two reports of increased striatal responsiveness to reward as a function of psychopathy level in healthy individuals (Bjork et al., 2012; Buckholtz et al., 2010). These results echo considerable data indicating that healthy participants who report increased impulsivity show heightened striatal responses to reward (Plichta & Scheres, 2014). Strikingly though, decreased, rather than increased, striatal responsiveness to reward is seen in individuals with ADHD, the classic clinical condition associated with impulsivity (for a recent meta-analytic review of this literature, see Plichta & Scheres, 2014). Similarly, most of the work on youth exhibiting conduct disorder with and without psychopathic traits has also revealed reduced striatal and/or ventromedial prefrontal cortex responsiveness to reward (Crowley et al., 2010; Finger et al., 2011; Rubia, Smith, et al., 2009; White, Pope, et al., 2013), with only one exception (Bjork, Chen, Smith, & Hommer, 2010). In addition, one study of adults with psychopathy revealed no indication of heightened striatal reward sensitivity (Pujara, Motzkin, Newman, Kiehl, & Koenigs, 2014), while a second, mirroring the findings in youth samples, reported decreased striatal reward sensitivity (in this case, to drug cues; Cope et al., 2014). In short, while heightened reward sensitivity may be a feature of self-reported impulsivity in healthy individuals, available data indicate that it is not a feature of individuals with impulse control disorders, including psychopathy.

2. Reduced reward sensitivity/responsiveness is expected to result in an individual who makes poorer decisions. The response choices of such individuals will be less well guided by expectations that an action will result in reward relative to punishment, rendering them more impulsive. In addition, they are more prone to become frustrated, as their actions will be less likely to achieve their goals (Blair, 2010). Increased frustration is associated with increased reactive aggression (Berkowitz, 1993). As noted earlier, findings from most studies indicate that adults and adolescents with clinical levels of conduct problems show reduced neural responsiveness to reward (Cope et al., 2014; Crowley et al., 2010; Finger et al., 2011; Rubia, Smith, et al., 2009; White, Pope, et al., 2013), as do patients with ADHD (Plichta & Scheres, 2014). It is worth noting that *reduced* striatal activity in response to rewards is also seen in individuals at heightened risk for the development of substance abuse either because of familial alcoholism (Heitzeg, Nigg, Yau, Zubieta, & Zucker, 2008; Yau et al., 2012) or their status as risk takers (Schneider et al., 2012). Notably, in one of the few studies that examined the characteristics of youth at risk who transition into substance use, such youth likewise showed reduced striatal activity in response to reward (Norman et al., 2011). There is also evidence of reduced responsiveness to unexpected reward in adults with substance dependence (Tanabe et al., 2013).

While there is considerable evidence that individuals with externalizing problems, not just those with psychopathic traits but also those with externalizing problems more broadly (i.e., conduct disorder generally, ADHD, and substance abuse), show reduced sensitivity to reward, the computational details of this impairment remain underspecified. One possibility is that the basic response to reward is reduced (i.e., the response to the amount of reward received); Crowley et al., 2010; Finger et al., 2011; Rubia, Smith, et al., 2009). However, this may be more a reflection of reduced reward prediction-error signaling. Prediction errors represent the difference between the outcome that was expected and what was received. Research findings show that the greater the prediction error, the greater the dopaminergic signal and the greater the activity in striatum (winning \$1,000 unexpectedly is more rewarding than receiving \$1,000 when you expected to; O'Doherty, 2012). As such, the prediction error signal is a critical cue for learning: The greater the signal, the greater the learning (Rescorla & Wagner, 1972). Youth with conduct disorder show reduced reward predictionerror signals within the striatum (White, Pope, et al., 2013). In addition, for successful decision making to occur, it is critical to accurately represent the value of the action or object that is about to be chosen (Schoenbaum et al., 2011). It appears that
youth with conduct disorder also show reduced signaling of expected value when choosing objects (White, Pope, et al., 2013). In addition, other work has shown a reduction in the striatal response to the reward value of drug-related pictures relative to neutral pictures in drug-dependent patients with high psychopathy levels compared to drugdependent patients low in psychopathy (Cope et al., 2014). In summary, then, reduced reward sensitivity is a feature of patients with impulse control disorders in general, including (but not limited to) psychopathy.

3. Dysfunctional processing of punishment cues results in an individual being less likely to avoid actions/objects associated with undesirable consequences. This is also likely to lead to frustration and frustration-induced reactive aggression (Blair, 2010). Usually, consequences that are worse than expected (e.g., losing \$1,000 when you were expecting to win \$1,000) are associated with decreased responses in the striatum and ventromedial prefrontal cortex (Balleine & O'Doherty, 2010; O'Doherty, 2012). However, several studies have reported an atypical increased response to punishment within the striatum and ventromedial prefrontal cortex in youth with conduct disorder (Crowley et al., 2010; Finger et al., 2008, 2011; White, Pope, et al., 2013). Indeed, adolescents with conduct disorder specifically have been found to show a positive relationship between prediction errors (PEs) to punishment and activity within the striatum (White, Pope, et al., 2013). Our preliminary hypothesis as to the basis of this atypical result is that the dysfunction associated with conduct disorder interferes with valence-based modulation of dopaminergic PE signaling (i.e., there is less augmentation for a positive PE and less suppression for a negative PE), but that novelty-based modulation of dopaminergic activity remains intact. From this standpoint, the increased response to punishment only reflects the novelty of the occurrence in individuals with conduct disorder. However, this hypothesis requires formal testing.

4. Dysfunction in the neural systems implicated in avoidance behavior should result in an individual who is more likely to make inappropriate behavioral choices. In particular, the anterior insula cortex, dorsomedial frontal cortex, and caudate nucleus appear to be critical for implementing avoidance responses (Budhani et al., 2007; Casey et al., 2001; Kuhnen & Knutson, 2005; Liu et al., 2007), probably because of their general role in response control (see below). It appears that these regions are sensitive to the expected value of particular response options and that they respond as a function of this expected value when suboptimal choices are about to made (Kuhnen & Knutson, 2005; White, Fowler, et al., 2014; White, Pope, et al., 2013). However, youth with conduct problems show less recruitment of these regions when making suboptimal choices as a function of expected value (White, Fowler, et al., 2014; White, Pope, et al., 2013).

There are several ways in which reinforcementbased decision making might increase the risk for antisocial behavior. First, disruptions in prediction error and expected value signaling interfere with socialization, rendering the individual less likely to learn to avoid actions that cause harm to other individuals. Related to this, weakened representation of the negative valence associated with the victim's distress means that the individual will find it easier to enact behaviors that harm others. Second, disrupted decision making will result in increased frustration; the individual's decisions will be less likely to achieve their goals. Increased frustration-based reactive aggression may be a consequence of this.

Third, impairment in the representation of reinforcement expectancies may contribute to an increased risk for reactive aggression more generally, as evidenced by findings from laboratory aggression studies. The principal laboratory procedures used to study reactive aggression in humans are the Taylor aggression paradigm (TAP; Taylor, 1967) and the point subtraction aggression paradigm (PSAP; Cherek, Moeller, Schnapp, & Dougherty, 1997). In these paradigms, participants receive provocations (e.g., aversive thermal stimulation or money loss administered) from task competitors with the opportunity to retaliate, and reactive aggression is indexed by the intensity of the retaliatory response. Neuroimaging research has shown this retaliatory behavior to be associated with activation of the periaqueductal gray, one of the brain regions implicated (as noted earlier) in reactive aggression (White, Brislin, Meffert, Sinclair, & Blair, 2013; White, Brislin, Sinclair, & Blair, 2014). However, the participant's retaliatory responses in paradigms of this type are not automatic. They involve the selection of a button press associated with a level of retaliation to the provocateur. As such, they involve instrumental behavioral choices, and research evidence indicates that they recruit regions implicated in representing the value of behavioral choices (White, Brislin, et al., 2013, 2014). In summary, impairment in the normal role played by the ventromedial prefrontal cortex in the representation of reinforcement expectancies is expected to increase the risk for reactive aggression because the costs and benefits of engaging in reactive aggression are not properly represented.

# Response Control

Core regions engaged in response selection include inferior frontal cortex/anterior insula cortex, dorsomedial frontal cortex, and striatum (see Figure 17.6). The suggestion here is that the inferior frontal cortex and anterior insula cortex prime motor responses within the striatum (Budhani, Richell, & Blair, 2006), potentially as a function of processes mediated by the dorsomedial frontal cortex-namely, conflict monitoring (Botvinick, Cohen, & Carter, 2004) and representation of response–outcome combinations (Alexander & Brown, 2011). Notably, however, this neural circuitry is also recruited when avoiding a suboptimal choice (i.e., when preparing to make a response choice associated with punishment or withholding a response that would gain reward; Budhani et al., 2007; Casey et al., 2001; Kuhnen & Knutson, 2005; Liu et al., 2007); that is, these systems operate to alter or stop behavior in situations of conflict. Tasks indexing response selection—inhibition include the Stroop interference and go/no-go tasks (Criaud & Boulinguez, 2013). An individual with impairment in these systems is likely to "impulsively" enact behaviors that are nonoptimal in a given situation, and that would be suppressed if these systems were working properly.

Considerable evidence indicates that patients with ADHD, particularly those who display motor disinhibition, show impairment in the systems mediating response selection, as evidenced by significant impairments on measures of response selection such as Stroop, stop-signal, and go/no-go tasks (Depue, Burgess, Willcutt, Ruzic, & Banich, 2010; Pennington & Ozonoff, 1996). In addition, studies have frequently documented reduced recruitment of dorsomedial frontal cortex and/or inferior frontal cortex/anterior insula cortex during the performance of these or similar tasks in patients with ADHD (Rubia et al., 2008; Rubia, Halari, et al., 2009; Rubia, Smith, et al., 2009; Schulz et al., 2004).

It does not appear that there is a specific deficit in response selection or inhibition in individuals with psychopathy or conduct disorder, at least if the relationship with ADHD is removed (Morgan & Lilienfeld, 2000; Pennington & Ozonoff, 1996). However, it does seem possible that a problem with response selection–disinhibition might increase



**FIGURE 17.6.** Systems involved in response control. The dorsomedial frontal cortex is involved in conflict monitoring (Botvinick et al., 2004) and/or the representation of response–outcome combinations (Alexander & Brown, 2011). The inferior frontal/anterior insula cortex responds to signals from the dorsomedial frontal cortex and selects responses via the caudate.

the risk for impulsive antisocial behavior generally across disorders (Hwang et al., 2016; Miyake & Friedman, 2012; Patrick, Fowles, & Krueger, 2009; Young et al., 2009). For example, Young and colleagues (2009) reported that a common "executive function (EF)/inhibition" variable reflecting performance across different inhibitory-control tasks was correlated to a substantial negative degree (-.63) with a latent "behavioral disinhibition" variable reflecting general proneness to externalizing problems, including attention-deficit symptoms (often shown by individuals with conduct disorder and substance use, as well as ADHD). Consistent with the findings of Young and colleagues, youth with conduct disorder and oppositional defiant disorder have been found to show lesser recruitment of dorsomedial frontal cortex, inferior frontal cortex/anterior insula cortex, and striatum when making suboptimal choices as a function of expected values (White, Fowler, et al., 2014; White, Pope, et al., 2013). Thus, while healthy individuals show greater dorsomedial frontal cortex, inferior frontal/anterior insular, and striatum activity in relation to more inappropriate actions (i.e., actions expected to result in adverse consequences), this is seen less in youth with conduct disorder and oppositional defiant disorder.

#### Conclusions

Figure 17.7 is a schematic of the four broad dimensions of functioning that have been the major foci of this chapter, and their relations with behavioral phenomena. Specifically, deficits in empathy are related to externalizing behavior marked by salient CU traits and instrumental aggression, whereas increased acute threat responding is associated with externalizing behavior marked by threat-based reactive aggression. Deficits in reinforcement-based decision-making and response selection are related to different forms of impulsivity and appear to be present in patients with both the variant of externalizing disorder marked by empathy impairment, and the variant that is associated with heightened acute threat responding. What remains unclear is the relationship between these functional domains. While reduced empathic responding and heightened acute threat reactivity should be mutually exclusive (one relies on decreased, and the other relies on increased amygdala responses to stimuli), it remains unclear what relationship these impairments may have with deficits in reinforcement-based decision making and response selection. In other words, is the severity of empathy impairment an individual shows related to his



**FIGURE 17.7.** A schematic of the four functional domains and their behavioral sequelae. The dysfunctions "reduced empathy" and "heightened acute threat response" are depicted as mutually exclusive.

or her level of impairment in reinforcement-based decision making? If yes, what is the causal basis of this association (i.e., in terms of genetic and/ or environmental influences)? Answers to these questions will be important for improving treatment assignment decisions and in developing individualized interventions.

#### ACKNOWLEDGMENTS

The authors report no competing interests. This work was supported by the Intramural Research Program of the National Institute of Mental Health, National Institutes of Health (1-ZIA-MH002860-08).

#### REFERENCES

- Adolphs, R., Gosselin, F., Buchanan, T. W., Tranel, D., Schyns, P., & Damasio, A. R. (2005). A mechanism for impaired fear recognition after amygdala damage. *Nature*, 433(7021), 68–72.
- Alexander, W. H., & Brown, J. W. (2011). Medial prefrontal cortex as an action-outcome predictor. *Nature Neuroscience*, 14(10), 1338–1344.
- Anastassiou-Hadjicharalambous, X., & Warden, D. (2008). Physiologically-indexed and self-perceived affective empathy in conduct-disordered children high and low on callous–unemotional traits. *Child Psychiatry and Human Development*, 39(4), 503–517.
- Anderson, N. E., & Kiehl, K. A. (2012). The psychopath magnetized: Insights from brain imaging. *Trends in Cognitive Sciences*, 16(1), 52–60.
- Aniskiewicz, A. S. (1979). Autonomic components of vicarious conditioning and psychopathy. *Journal of Clinical Psychology*, 35, 60–67.
- Balleine, B. W., & O'Doherty, J. P. (2010). Human and rodent homologues in action control: Corticostriatal determinants of goal-directed and habitual action. *Neuropsychopharmacology*, 35, 48–69.
- Baskin-Sommers, A. R., Curtin, J. J., & Newman, J. P. (2011). Specifying the attentional selection that moderates the fearlessness of psychopathic offenders. *Psychological Science*, 22(2), 226–234.
- Berkowitz, L. (1993). Aggression: Its causes, consequences, and control. Philadelphia: Temple University Press.
- Birbaumer, N., Veit, R., Lotze, M., Erb, M., Hermann, C., Grodd, W., et al. (2005). Deficient fear conditioning in psychopathy: A functional magnetic resonance imaging study. Archives of General Psychiatry, 62(7), 799–805.
- Bjork, J. M., Chen, G., & Hommer, D. W. (2012). Psychopathic tendencies and mesolimbic recruitment by cues for instrumental and passively obtained rewards. *Biological Psycholology*, 89(2), 408–415.
- Bjork, J. M., Chen, G., Smith, A. R., & Hommer, D. W. (2010). Incentive-elicited mesolimbic activation and

externalizing symptomatology in adolescents. *Journal* of Child Psychology and Psychiatry, 51, 827–837.

- Blair, K. S., Marsh, A. A., Morton, J., Vythilingham, M., Jones, M., Mondillo, K., et al. (2006). Choosing the lesser of two evils, the better of two goods: Specifying the roles of ventromedial prefrontal cortex and dorsal anterior cingulate cortex in object choice. *Journal of Neuroscience*, 26(44), 11379–11386.
- Blair, K. S., Smith, B. W., Mitchell, D. G., Morton, J., Vythilingam, M., Pessoa, L., et al. (2007). Modulation of emotion by cognition and cognition by emotion. *NeuroImage*, 35(1), 430–440.
- Blair, K. S., Vythilingam, M., Crowe, S. L., McCaffrey, D. E., Ng, P., Wu, C. C., et al. (2013). Cognitive control of attention is differentially affected in traumaexposed individuals with and without post-traumatic stress disorder. *Psychological Medicine*, 43(1), 85–95.
- Blair, R. J. R. (1995). A cognitive developmental approach to morality: Investigating the psychopath. *Cognition*, 57, 1–29.
- Blair, R. J. R. (1997). Moral reasoning in the child with psychopathic tendencies. *Personality and Individual Differences*, 22, 731–739.
- Blair, R. J. R. (1999). Responsiveness to distress cues in the child with psychopathic tendencies. *Personality* and Individual Differences, 27, 135–145.
- Blair, R. J. R. (2003). Facial expressions, their communicatory functions and neuro-cognitive substrates. *Philosophical Transactions of the Royal Society of London B: Biolological Sciences*, 358(1431), 561–572.
- Blair, R. J. R. (2004). The roles of orbital frontal cortex in the modulation of antisocial behavior. *Brain and Cognition*, 55(1), 198–208.
- Blair, R. J. R. (2005). Responding to the emotions of others: Dissociating forms of empathy through the study of typical and psychiatric populations. *Con*sciousness and Cognition, 14(4), 698–718.
- Blair, R. J. R. (2006) Dissociable systems for empathy. In G. Bock & J. Goode (Eds.), *Empathy and fairness: Novartis Foundation Symposium* 278 (pp. 134–145). Chichester, UK: Wiley.
- Blair, R. J. R. (2007). The amygdala and ventromedial prefrontal cortex in morality and psychopathy. *Trends in Cognitive Sciences*, 11(9), 387–392.
- Blair, R. J. R. (2010). Psychopathy, frustration, and reactive aggression: The role of ventromedial prefrontal cortex. British Journal of Psychology, 101, 383–399.
- Blair, R. J. (2013). The neurobiology of psychopathic traits in youths. *Nature Reviews Neuroscience*, 14(11), 786–799.
- Blair, R. J. R., Budhani, S., Colledge, E., & Scott, S. (2005). Deafness to fear in boys with psychopathic tendencies. *Journal of Child Psychology and Psychiatry*, 46(3), 327–336.
- Blair, R. J. R., Colledge, E., Murray, L., & Mitchell, D. G. (2001). A selective impairment in the processing of sad and fearful expressions in children with psychopathic tendencies. *Journal of Abnormal Child Psychology*, 29(6), 491–498.

- Blair, R. J. R., & Mitchell, D. G. (2009). Psychopathy, attention and emotion. *Psychological Medicine*, 39(4), 543–555.
- Blair, R. J. R., Morris, J. S., Frith, C. D., Perrett, D. I., & Dolan, R. (1999). Dissociable neural responses to facial expressions of sadness and anger. *Brain*, 122, 883–893.
- Blair, R. J. R., Sellars, C., Strickland, I., Clark, F., Williams, A., Smith, M., et al. (1996). Theory of mind in the psychopath. *Journal of Forensic Psychiatry*, 7, 15–25.
- Blanchard, R. J., Blanchard, D. C., & Takahashi, L. K. (1977). Attack and defensive behaviour in the albino rat. Animal Behavior, 25, 197–224.
- Boccardi, M., Frisoni, G. B., Hare, R. D., Cavedo, E., Najt, P., Pievani, M., et al. (2011). Cortex and amygdala morphology in psychopathy. *Psychiatry Research*, 193(2), 85–92.
- Botvinick, M. M., Cohen, J. D., & Carter, C. S. (2004). Conflict monitoring and anterior cingulate cortex: An update. *Trends in Cognitive Sciences*, 8(12), 539– 546.
- Brodmann, K. (1909). Vergleichende lokalisationlehre der grosshirnrinde in ihren prinzipien dargestellt auf grund des zellenbaues [Comparative localization studies in the brain cortex, its fundamentals represented on the basis of its cellular architecture]. Leipzig: J. A. Barth.
- Buckholtz, J. W., Treadway, M. T., Cowan, R. L., Woodward, N. D., Benning, S. D., Li, R., et al. (2010). Mesolimbic dopamine reward system hypersensitivity in individuals with psychopathic traits. *Nature Neuroscience*, 13, 419–421.
- Budhani, S., Marsh, A. A., Pine, D. S., & Blair, R. J. R. (2007). Neural correlates of response reversal: Considering acquisition. *NeuroImage*, 34(4), 1754–1765.
- Budhani, S., Richell, R. A., & Blair, R. J. (2006). Impaired reversal but intact acquisition: Probabilistic response reversal deficits in adult individuals with psychopathy. *Journal of Abnormal Psychology*, 115(3), 552–558.
- Buhle, J. T., Silvers, J. A., Wager, T. D., Lopez, R., Onyemekwu, C., Kober, H., et al. (2014). Cognitive reappraisal of emotion: A meta-analysis of human neuroimaging studies. *Cerebral Cortex*, 24(11), 2981–2990.
- Buitelaar, J. K., Van der Wees, M., Swabb-Barneveld, H., & Van der Gaag, R. J. (1999). Theory of mind and emotion-recognition functioning in autistic spectrum disorders and in psychiatric control and normal children. *Development and Psychopathology*, 11, 39–58.
- Carré, J. M., Hyde, L. W., Neumann, C. S., Viding, E., & Hariri, A. R. (2013). The neural signatures of distinct psychopathic traits. *Social Neuroscience*, 8, 122–135.
- Casey, B. J., Forman, S. D., Franzen, P., Berkowitz, A., Braver, T. S., Nystrom, L. E., et al. (2001). Sensitivity of prefrontal cortex to changes in target probability: A functional MRI study. *Human Brain Mapping*, 13(1), 26–33.
- Cheng, Y., Hung, A. Y., & Decety, J. (2012). Dissocia-

tion between affective sharing and emotion understanding in juvenile psychopaths. *Development and Psychopathology*, 24(2), 623–636.

- Cherek, D. R., Moeller, F. G., Schnapp, W., & Dougherty, D. M. (1997). Studies of violent and nonviolent male parolees: I. Laboratory and psychometric measurements of aggression. *Biological Psychiatry*, 41, 514–522.
- Christianson, S. A., Forth, A. E., Hare, R. D., Strachan, C., Lidberg, L., & Thorell, L. H. (1996). Remembering details of emotional events: A comparison between psychopathic and nonpsychopathic offenders. *Personality and Individual Differences*, 20, 437–443.
- Coccaro, E. F., McCloskey, M. S., Fitzgerald, D. A., & Phan, K. L. (2007). Amygdala and orbitofrontal reactivity to social threat in individuals with impulsive aggression. *Biological Psychiatry*, 62(2), 168–178.
- Coker-Appiah, D. S., White, S. F., Clanton, R., Yang, J., Martin, A., & Blair, R. J. (2013). Looming animate and inanimate threats: The response of the amygdala and periaqueductal gray. *Social Neuroscience*, 8(6), 621–630.
- Cope, L. M., Vincent, G. M., Jobelius, J. L., Nyalakanti, P. K., Calhoun, V. D., & Kiehl, K. A. (2014). Psychopathic traits modulate brain responses to drug cues in incarcerated offenders. *Frontiers of Human Neurosci*ence, 8, 87.
- Craig, M. C., Catani, M., Deeley, Q., Latham, R., Daly, E., Kanaan, R., et al. (2009). Altered connections on the road to psychopathy. *Molecular Psychiatry*, 14(10), 907, 946–953.
- Criaud, M., & Boulinguez, P. (2013). Have we been asking the right questions when assessing response inhibition in go/no-go tasks with fMRI?: A meta-analysis and critical review. *Neuroscience and Biobehavioral Reviews*, 37(1), 11–23.
- Crowe, S. L., & Blair, R. J. R. (2008). The development of antisocial behavior: What can we learn from functional neuroimaging studies? *Development and Psychopathology*, 20, 1145–1159.
- Crowley, T. J., Dalwani, M. S., Mikulich-Gilbertson, S. K., Du, Y. P., Lejuez, C. W., Raymond, K. M., & Banich, M. T. (2010). Risky decisions and their consequences: Neural processing by boys with Antisocial Substance Disorder. PLOS ONE, 5(9), e12835.
- Dadds, M. R., El Masry, Y., Wimalaweera, S., & Guastella, A. J. (2008). Reduced eye gaze explains "fear blindness" in childhood psychopathic traits. *Journal* of the American Academy of Child and Adolescent Psychiatry, 47, 455–463.
- Dadds, M. R., Jambrak, J., Pasalich, D., Hawes, D. J., & Brennan, J. (2011). Impaired attention to the eyes of attachment figures and the developmental origins of psychopathy. *Journal of Child Psychology and Psychia*try, 52(3), 238–245.
- Dadds, M. R., Perry, Y., Hawes, D. J., Merz, S., Riddell, A. C., Haines, D. J., et al. (2006). Attention to the eyes and fear-recognition deficits in child psychopathy. *British Journal of Psychiatry*, 189, 280–281.

- Dalwani, M., Sakai, J. T., Mikulich-Gilbertson, S. K., Tanabe, J., Raymond, K., McWilliams, S. K., et al. (2011). Reduced cortical gray matter volume in male adolescents with substance and conduct problems. *Drug and Alcohol Dependence*, 118(2–3), 295–305.
- Dawel, A., O'Kearney, R., McKone, E., & Palermo, R. (2012). Not just fear and sadness: Meta-analytic evidence of pervasive emotion recognition deficits for facial and vocal expressions in psychopathy. *Neuroscience and Biobehavioral Reviews*, 36(10), 2288–2304.
- Dayan, P., & Balleine, B. W. (2002). Reward, motivation, and reinforcement learning. *Neuron*, 36(2), 285–298.
- De Brito, S. A., Mechelli, A., Wilke, M., Laurens, K. R., Jones, A. P., Barker, G. J., et al. (2009). Size matters: Increased grey matter in boys with conduct problems and callous–unemotional traits. *Brain*, 132, 843–852.
- de Oliveira-Souza, R., Hare, R. D., Bramati, I. E., Garrido, G. J., Ignacio, F. A., Tovar-Moll, F., et al. (2008). Psychopathy as a disorder of the moral brain: Frontotemporo-limbic grey matter reductions demonstrated by voxel-based morphometry. *NeuroImage*, 40, 1202– 1213.
- de Wied, M., van Boxtel, A., Matthys, W., & Meeus, W. (2012). Verbal, facial and autonomic responses to empathy-eliciting film clips by disruptive male adolescents with high versus low callous–unemotional traits. Journal of Abnormal Child Psychology, 40(2), 211–223.
- Decety, J. (2011). The neuroevolution of empathy. Annals of the New York Academy of Sciences, 1231, 35–45.
- Decety, J., Chen, C., Harenski, C., & Kiehl, K. A. (2013). An fMRI study of affective perspective taking in individuals with psychopathy: Imagining another in pain does not evoke empathy. *Frontiers of Human Neuroscience*, 7, 489.
- Decety, J., Michalska, K. J., Akitsuki, Y., & Lahey, B. B. (2009). Atypical empathic response in adolescents with aggressive conduct disorder: A functional MRI investigation. *Biological Psychology*, 80, 203–211.
- Decety, J., Skelly, L. R., & Kiehl, K. A. (2013). Brain response to empathy-eliciting scenarios involving pain in incarcerated individuals with psychopathy. JAMA Psychiatry, 70(6), 638–645.
- Decety, J., Skelly, L., Yoder, K. J., & Kiehl, K. A. (2014). Neural processing of dynamic emotional facial expressions in psychopaths. Social Neuroscience, 9(1), 36–49.
- Deeley, Q., Daly, E., Surguladze, S., Tunstall, N., Mezey, G., Beer, D., et al. (2006). Facial emotion processing in criminal psychopathy: Preliminary functional magnetic resonance imaging study. *British Journal of Psychiatry*, 189, 533–539.
- Depue, B. E., Burgess, G. C., Willcutt, E. G., Ruzic, L., & Banich, M. T. (2010). Inhibitory control of memory retrieval and motor processing associated with the right lateral prefrontal cortex: Evidence from deficits in individuals with ADHD. *Neuropsychologia*, 48(13), 3909–3917.

- Desimone, R., & Duncan, J. (1995). Neural mechanisms of selective visual attention. Annual Review of Neuroscience, 18, 193–222.
- Dodge, K. A., Lochman, J. E., Harnish, J. D., Bates, J. E., & Pettit, G. S. (1997). Reactive and proactive aggression in school children and psychiatrically impaired chronically assaultive youth. *Journal of Abnormal Psychology*, 106(1), 37–51.
- Dodge, K. A., Pettit, G. S., Bates, J. E., & Valente, E. (1995). Social information-processing patterns partially mediate the effect of early physical abuse on later conduct problems. *Journal of Abnormal Psychol*ogy, 104, 632–643.
- Dolan, M. C., & Fullam, R. S. (2009). Psychopathy and functional magnetic responance imaging blood oxygenation level-dependent responses to emotional faces in violence patients with schizophrenia. *Biological Psychiatry*, 66, 570–577.
- Ermer, E., Cope, L. M., Nyalakanti, P. K., Calhoun, V. D., & Kiehl, K. A. (2012). Aberrant paralimbic gray matter in criminal psychopathy. *Journal of Abnormal Psychology*, 121(3), 649–658.
- Ermer, E., Cope, L. M., Nyalakanti, P. K., Calhoun, V. D., & Kiehl, K. A. (2013). Aberrant paralimbic gray matter in incarcerated male adolescents with psychopathic traits. *Journal of the American Academy of Child and Adolescent Psychiatry*, 52(1), 94–103.
- Fahim, C., He, Y., Yoon, U., Chen, J., Evans, A., & Perusse, D. (2011). Neuroanatomy of childhood disruptive behavior disorders. Aggressive Behavior, 37(4), 326–337.
- Fairchild, G., Hagan, C. C., Walsh, N. D., Passamonti, L., Calder, A. J., & Goodyer, I. M. (2013). Brain structure abnormalities in adolescent girls with conduct disorder. *Journal of Child Psychology and Psychia*try, 54(1), 86–95.
- Fairchild, G., Passamonti, L., Hurford, G., Hagan, C. C., von dem Hagen, E. A., van Goozen, S. H., et al. (2011). Brain structure abnormalities in early-onset and adolescent-onset conduct disorder. *American Journal of Psychiatry*, 168(6), 624–633.
- Finger, E. C., Marsh, A., Blair, K. S., Majestic, C., Evangelou, I., Gupta, K., et al. (2012). Impaired functional but preserved structural connectivity in limbic white matter tracts in youth with conduct disorder or oppositional defiant disorder plus psychopathic traits. *Psychiatry Research*, 202(3), 239–244.
- Finger, E. C., Marsh, A. A., Blair, K. S., Reid, M. E., Sims, C., Ng, P., et al. (2011). Disrupted reinforcement signaling in the orbital frontal cortex and caudate in youths with conduct disorder or oppositional defiant disorder and a high level of psychopathic traits. *American Journal of Psychiatry*, 168(2), 834–841.
- Finger, E. C., Marsh, A. A., Mitchell, D. G. V., Reid, M. E., Sims, C., Budhani, S., et al. (2008). Abnormal ventromedial prefrontal cortex function in children with psychopathic traits during reversal learning. Archives of General Psychiatry, 65(5), 586–594.

- Fridlund, A. (1992). Darwin's anti-Darwinism in The Expression of the Emotions in Man and Animals. In K. T. Strongman (Ed.), International review of emotion (Vol. 2, pp. 117–137). New York: Wiley.
- Frith, U. (1989). Autism: Explaining the enigma. Oxford, UK: Blackwell.
- Glenn, A. L., Raine, A., & Schug, R. A. (2008). The neural correlates of moral decision-making in psychopathy. *Molecular Psychiatry*, 14, 5–6.
- Gregg, T. R., & Siegel, A. (2001). Brain structures and neurotransmitters regulating aggression in cats: implications for human aggression. Progress in Neuropsychopharmacology and Biological Psychiatry, 25(1), 91–140.
- Gregory, S., ffytche, D., Simmons, A., Kumari, V., Howard, M., Hodgins, S., et al. (2012). The antisocial brain: Psychopathy matters. Archives of General Psychiatry, 69(9), 962–972.
- Gyurak, A., Gross, J. J., & Etkin, A. (2011). Explicit and implicit emotion regulation: A dual-process framework. Cognition and Emotion, 25(3), 400–412.
- Happé, F., & Frith, U. (2014). Annual research review: Towards a developmental neuroscience of atypical social cognition. *Journal of Child Psychology and Psychiatry*, 55(6), 553–557.
- Harenski, C. L., Harenski, K. A., Shane, M. S., & Kiehl, K. A. (2010). Aberrant neural processing of moral violations in criminal psychopaths. *Journal of Abnor*mal Psychology, 119(4), 863–874.
- Heitzeg, M. M., Nigg, J. T., Yau, W. Y., Zubieta, J. K., & Zucker, R. A. (2008). Affective circuitry and risk for alcoholism in late adolescence: Differences in frontostriatal responses between vulnerable and resilient children of alcoholic parents. *Alcoholism: Clinical and Experimental Research*, 32(3), 414–426.
- Hiatt, K. D., Schmitt, W. A., & Newman, J. P. (2004). Stroop tasks reveal abnormal selective attention among psychopathic offenders. *Neuropsychology*, 18, 50–59.
- House, T. H., & Milligan, W. L. (1976). Autonomic responses to modeled distress in prison psychopaths. *Journal of Personality and Social Psychology*, 34, 556– 560.
- Huebner, B., Vloet, T. D., Marx, I., Konrad, K., Fink, G. R., Herpertz, S. C., et al. (2008). Morphometric brain abnormalities in boys with conduct disorder. *Journal* of the American Academy of Child and Adolescent Psychiatry, 47, 540–547.
- Hwang, S., Nolan, Z. T., White, S. F., Williams, W. C., Sinclair, S., & Blair, R. J. (2016). Dual neurocircuitry dysfunctions in disruptive behavior disorders: Emotional responding and response inhibition. *Psychological Medicine*, 46(7), 1485–1496.
- Hyatt, C. J., Haney-Caron, E., & Stevens, M. C. (2012). Cortical thickness and folding deficits in conductdisordered adolescents. *Biological Psychiatry*, 72(3), 207–214.
- Jeon, D., Kim, S., Chetana, M., Jo, D., Ruley, H. E., Lin, S. Y., et al. (2010). Observational fear learning in-

volves affective pain system and Cav1.2 Ca2+ channels in ACC. *Nature Neuroscience*, 13(4), 482–488.

- Jones, A. P., Laurens, K. R., Herba, C. M., Barker, G. J., & Viding, E. (2009). Amygdala hypoactivity to fearful faces in boys with conduct problems and callous– unemotional traits. *American Journal of Psychiatry*, 166, 95–102.
- Jusyte, A., Mayer, S. V., Kunzel, E., Hautzinger, M., & Schonenberg, M. (2015). Unemotional traits predict early processing deficit for fearful expressions in young violent offenders: An investigation using continuous flash suppression. *Psychological Medicine*, 45(2), 285–297.
- Kennedy, D. P., & Adolphs, R. (2012). The social brain in psychiatric and neurological disorders. *Trends in Cognitive Sciences*, 16(11), 559–572.
- Kiehl, K. A. (2006). A cognitive neuroscience perspective on psychopathy: Evidence for paralimbic system dysfunction. *Psychiatry Research*, 142, 107–128.
- Kiehl, K. A., Smith, A. M., Hare, R. D., Mendrek, A., Forster, B. B., Brink, J., et al. (2001). Limbic abnormalities in affective processing by criminal psychopaths as revealed by functional magnetic resonance imaging. *Biological Psychiatry*, 50, 677–684.
- Klinnert, M. D., Emde, R. N., Butterfield, P., & Campos, J. J. (1987). Social referencing: The infant's use of emotional signals from a friendly adult with mother present. Annual Progress in Child Psychiatry and Child Development, 22, 427–432.
- Koenigs, M., Kruepke, M., Zeier, J., & Newman, J. P. (2012). Utilitarian moral judgment in psychopathy. Social Cognitive and Affective Neuroscience, 7(6), 708–714.
- Krusei, M. J. P., Casanova, M. F., Mannheim, G., & Johnson-Bilder, A. (2004). Reduced temporal lobe volume in early onset conduct disorder. *Psychiatry Research*, 132, 1–11.
- Kuhnen, C. M., & Knutson, B. (2005). The neural basis of financial risk taking. *Neuron*, 47(5), 763–770.
- Lamm, C., Decety, J., & Singer, T. (2011). Meta-analytic evidence for common and distinct neural networks associated with directly experienced pain and empathy for pain. *NeuroImage*, 54(3), 2492–2502.
- Larson, C. L., Baskin-Sommers, A. R., Stout, D. M., Balderston, N. L., Curtin, J. J., Schultz, D. H., et al. (2013). The interplay of attention and emotion: Top-down attention modulates amygdala activation in psychopathy. Cognitive, Affective, and Behavioral Neuroscience, 13(4), 757–770.
- Lee, T. M. C., Chan, S.-C., & Raine, A. (2008). Strong limbic and weak frontal activation to aggressive stimuli in spouse abusers. *Molecular Psychiatry*, 13(7), 655–656.
- Liu, X., Powell, D. K., Wang, H., Gold, B. T., Corbly, C. R., & Joseph, J. E. (2007). Functional dissociation in frontal and striatal areas for processing of positive and negative reward information. *Journal of Neuroscience*, 27(17), 4587–4597.
- Lockwood, P. L., Sebastian, C. L., McCrory, E. J., Hyde,

Z. H., Gu, X., De Brito, S. A., et al. (2013). Association of callous traits with reduced neural response to others' pain in children with conduct problems. *Current Biology*, 23(10), 901–905.

- Lopez-Duran, N. L., Olson, S. L., Hajal, N. J., Felt, B. T., & Vazquez, D. M. (2009). Hypothalamic pituitary adrenal axis functioning in reactive and proactive aggression in children. *Journal of Abnormal Child Psychology*, 37(2), 169–182.
- Lozier, L. M., Cardinale, E. M., VanMeter, J. W., & Marsh, A. A. (2014). Mediation of the relationship between callous–unemotional traits and proactive aggression by amygdala response to fear among children with conduct problems. JAMA Psychiatry, 71(6), 627–636.
- Luo, Q., Mitchell, D. G. V., Cheng, X., Mondillo, K., Mccaffrey, D., Holroyd, T., et al. (2009). Visual awareness, emotion, and gamma band synchronization. *Cerebral Cortex*, 19, 1896–1904.
- Ly, M., Motzkin, J., Philippi, C., Kirk, G., Newman, J. P., Kiehl, K., et al. (2012). Cortical thinning in psychopathy. American Journal of Psychiatry, 169(7), 743–749.
- Marsh, A. A., & Blair, R. J. (2008). Deficits in facial affect recognition among antisocial populations: A meta-analysis. *Neuroscience and Biobehavioral Re*views, 32(3), 454–465.
- Marsh, A. A., Finger, E. C., Fowler, K. A., Adalio, C. J., Jurkowitz, I. T., Schechter, J. C., et al. (2013). Empathic responsiveness in amygdala and anterior cingulate cortex in youths with psychopathic traits. *Journal of Child Psychology and Psychiatry*, 54(8), 900–910.
- Marsh, A. A., Finger, E. C., Fowler, K. A., Jurkowitz, I. T., Schechter, J. C., Yu, H. H., et al. (2011). Reduced amygdala–orbitofrontal connectivity during moral judgments in youths with disruptive behavior disorders and psychopathic traits. *Psychiatry Research*, 194(3), 279–286.
- Marsh, A. A., Finger, E. C., Mitchell, D. G. V., Reid, M. E., Sims, C., Kosson, D. S., et al. (2008). Reduced amygdala response to fearful expressions in children and adolescents with callous–unemotional traits and disruptive behavior disorders. *American Journal of Psychiatry*, 165(6), 712–720.
- McCoy, A. N., & Platt, M. L. (2005). Expectations and outcomes: Decision-making in the primate brain. Journal of Comparative Physiology A: Neuroethology, Sensory, Neural, and Behavioral Physiology, 191(3), 201–211.
- Meffert, H., Brislin, S. J., White, S. F., & Blair, J. R. (2015). Prediction errors to emotional expressions: The roles of the amygdala in social referencing. *Social Cognitive and Affective Neuroscience*, 10(4), 537–544.
- Meffert, H., Gazzola, V., den Boer, J. A., Bartels, A. A., & Keysers, C. (2013). Reduced spontaneous but relatively normal deliberate vicarious representations in psychopathy. *Brain*, 136(8), 2550–2562.
- Mesulam, M. M. (Ed.). (2000). Principles of behavioral

*and cognitive neurology* (2nd ed.). New York: Oxford University Press.

- Miller, E. K., & Buschman, T. J. (2013). Cortical circuits for the control of attention. Current Opinion in Neurobiology, 23(2), 216–222.
- Mitchell, D. G., Luo, Q., Mondillo, K., Vythilingam, M., Finger, E. C., & Blair, R. J. (2008). The interference of operant task performance by emotional distracters: An antagonistic relationship between the amygdala and frontoparietal cortices. *NeuroImage*, 40(2), 859–868.
- Mitchell, D. G., Nakic, M., Fridberg, D., Kamel, N., Pine, D. S., & Blair, R. J. (2007). The impact of processing load on emotion. *NeuroImage*, 34(3), 1299–1309.
- Miyake, A., & Friedman, N. P. (2012). The nature and organization of individual differences in executive functions: Four general conclusions. Current Directions in Psychological Science, 21(1), 8–14.
- Mobbs, D., Marchant, J. L., Hassabis, D., Seymour, B., Tan, G., Gray, M., et al. (2009). From threat to fear: The neural organization of defensive fear systems in humans. *Journal of Neuroscience*, 29(39), 12236– 12243.
- Mobbs, D., Petrovic, P., Marchant, J. L., Hassabis, D., Weiskopf, N., Seymour, B., et al. (2007). When fear is near: Threat imminence elicits prefrontal-periacqueductal gray shifts in humans. *Science*, 317, 1079–1083.
- Mobbs, D., Yu, R., Rowe, J. B., Eich, H., FeldmanHall, O., & Dalgleish, T. (2010). Neural activity associated with monitoring the oscillating threat value of a tarantula. Proceedings of the National Academy of Sciences of the USA, 107(47), 20582–20586.
- Morgan, A. B., & Lilienfield, S. O. (2000). A meta-analytic review of the relation between antisocial behavior and neuropsychological measures of executive function. *Clinical Psychology Review*, 20, 113–136.
- Motzkin, J. C., Newman, J. P., Kiehl, K. A., & Koenigs, M. (2011). Reduced prefrontal connectivity in psychopathy. Journal of Neuroscience, 31(48), 17348– 17357.
- Muñoz, L. (2009). Callous–unemotional traits are related to combined deficits in recognizing afraid faces and body poses. Journal of American Academy of Child and Adolescent Psychiatry, 48(5), 554–562.
- Murphy, F. C., Nimmo-Smith, I., & Lawrence, A. D. (2003). Functional neuroanatomy of emotions: A meta-analysis. Cognitive, Affective, and Behavioral Neuroscience, 3(3), 207–233.
- New, A. S., Hazlett, E. A., Newmark, R. E., Zhang, J., Triebwasser, J., Meyerson, D., et al. (2009). Laboratory induced aggression: A positron emission tomography study of aggressive individuals with borderline personality disorder. *Biological Psychiatry*, 66(12), 1107–1114.
- Norman, A. L., Pulido, C., Squeglia, L. M., Spadoni, A. D., Paulus, M. P., & Tapert, S. F. (2011). Neural activation during inhibition predicts initiation of substance use in adolescence. *Drug and Alcohol Dependence*, 119(3), 216–223.

- Ochsner, K. N., Ray, R. D., Cooper, J. C., Robertson, E. R., Chopra, S., Gabrieli, J. D., et al. (2004). For better or for worse: Neural systems supporting the cognitive down- and up-regulation of negative emotion. *Neuro-Image*, 23(2), 483–499.
- O'Doherty, J. P. (2012). Beyond simple reinforcement learning: The computational neurobiology of rewardlearning and valuation. *European Journal of Neuroscience*, 35(7), 987–990.
- Panksepp, J. (1998). Affective neuroscience: The foundations of human and animal emotions. New York: Oxford University Press.
- Pardini, D. A., & Byrd, A. L. (2012). Perceptions of aggressive conflicts and others' distress in children with callous–unemotional traits: "I'll show you who's boss, even if you suffer and I get in trouble." *Journal of Child Psychology and Psychiatry*, 53(3), 283–291.
- Pardini, D. A., & Phillips, M. (2010). Neural responses to emotional and neutral facial expressions in chronically violent men. *Journal of Psychiatry and Neuroscience*, 35(6), 390–398.
- Passamonti, L., Fairchild, G., Fornito, A., Goodyer, I. M., Nimmo-Smith, I., Hagan, C. C., et al. (2012). Abnormal anatomical connectivity between the amygdala and orbitofrontal cortex in conduct disorder. PLOS ONE, 7(11), e48789.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. Development and Psychopathology, 21, 913–938.
- Patterson, C. M., & Newman, J. P. (1993). Reflectivity and learning from aversive events: Toward a psychological mechanism for the syndromes of disinhibition. Psychological Review, 100, 716–736.
- Pennington, B. F., & Ozonoff, S. (1996). Executive functions and developmental psychopathology. Journal of Child Psychology and Psychiatry, 37, 51–87.
- Pessoa, L., Kastner, S., & Ungerleider, L. G. (2002). Attentional control of the processing of neutral and emotional stimuli. *Cognitive Brain Research*, 15, 31–45.
- Pessoa, L., & Ungerleider, L. G. (2004). Neuroimaging studies of attention and the processing of emotionladen stimuli. *Progress in Brain Research*, 144, 171– 182.
- Plichta, M. M., & Scheres, A. (2014). Ventral-striatal responsiveness during reward anticipation in ADHD and its relation to trait impulsivity in the healthy population: A meta-analytic review of the fMRI literature. *Neuroscience and Biobehavioral Reviews*, 38, 125–134.
- Pujara, M., Motzkin, J. C., Newman, J. P., Kiehl, K. A., & Koenigs, M. (2014). Neural correlates of reward and loss sensitivity in psychopathy. Social Cognitive and Affective Neuroscience, 9(6), 794–801.
- Rangel, A., & Clithero, J. A. (2012). Value normalization in decision making: Theory and evidence. Current Opinion in Neurobiology, 22(6), 970–981.
- Rescorla, R. A., & Wagner, A. R. (1972). A theory of

Pavlovian conditioning: Variations in the effectiveness of reinforcement and nonreinforcement. In A. H. Black & W. F. Prokasy (Eds.), *Classical Conditioning II* (pp. 64–99). New York: Appleton-Century-Crofts.

- Rubia, K., Halari, R., Smith, A. B., Mohammad, M., Scott, S., & Brammer, M. J. (2009). Shared and disorder-specific prefrontal abnormalities in boys with pure attention-deficit/hyperactivity disorder compared to boys with pure CD during interference inhibition and attention allocation. *Journal of Child Psychology and Psychiatry*, 50(6), 669–678.
- Rubia, K., Halari, R., Smith, A. B., Mohammad, M., Scott, S., Giampietro, V., et al. (2008). Dissociated functional brain abnormalities of inhibitioni in boys with pure conduct disorder and in boys with pure attention deficit hyperactivity disorder. *American Journal of Psychiatry*, 165, 889–897.
- Rubia, K., Smith, A. B., Halari, R., Matsukura, F., Mohammad, M., Taylor, E., et al. (2009). Disorder-specific dissociation of orbitofrontal dysfunction in boys with pure conduct disorder during reward and ventrolateral prefrontal dysfunction in boys with pure ADHD during sustained attention. *American Journal* of Psychiatry, 166, 83–94.
- Sarkar, S., Craig, M. C., Catani, M., Dell'acqua, F., Fahy, T., Deeley, Q., et al. (2013). Frontotemporal whitematter microstructural abnormalities in adolescents with conduct disorder: A diffusion tensor imaging study. *Psychological Medicine*, 43(2), 401–411.
- Schneider, S., Peters, J., Bromberg, U., Brassen, S., Miedl, S. F., Banaschewski, T., et al. (2012). Risk taking and the adolescent reward system: A potential common link to substance abuse. *American Journal* of Psychiatry, 169(1), 39–46.
- Schoenbaum, G., Takahashi, Y., Liu, T. L., & McDannald, M. A. (2011). Does the orbitofrontal cortex signal value? Annals of the New York Academy of Sciences, 1239, 87–99.
- Schulz, K. P., Fan, J., Tang, C. Y., Newcorn, J. H., Buchsbaum, M. S., Cheung, A. M., et al. (2004). Response inhibition in adolescents diagnosed with attention deficit hyperactivity disorder during childhood: An event-related FMRI study. American Journal of Psychiatry, 161, 1650–1657.
- Sears, R. M., Schiff, H. C., & LeDoux, J. E. (2014). Molecular mechanisms of threat learning in the lateral nucleus of the amygdala. *Progress in Molecular Biology* and Translational Science, 122, 263–304.
- Sebastian, C. L., McCrory, E. J., Cecil, C. A., Lockwood, P. L., De Brito, S. A., Fontaine, N. M., et al. (2012). Neural responses to affective and cognitive theory of mind in children with conduct problems and varying levels of callous–unemotional traits. Archives of General Psychiatry, 69(8), 814–822.
- Sterzer, P., Stadler, C., Krebs, A., Kleinschmidt, A., & Poustka, F. (2005). Abnormal neural responses to emotional visual stimuli in adolescents with conduct disorder. *Biological Psychiatry*, 57(1), 7–15.

- Sterzer, P., Stadler, C., Poustka, F., & Kleinschmidt, A. (2007). A structural neural deficit in adolescents with conduct disorder and its association with lack of empathy. *NeuroImage*, 37(1), 335–342.
- Stevens, D., Charman, T., & Blair, R. J. R. (2001). Recognition of emotion in facial expressions and vocal tones in children with psychopathic tendencies. *Journal of Genetic Psychology*, 162(2), 201–211.
- Sundram, F., Deeley, Q., Sarkar, S., Daly, E., Latham, R., Craig, M., et al. (2012). White matter microstructural abnormalities in the frontal lobe of adults with antisocial personality disorder. *Cortex*, 48(2), 216–229.
- Sylvers, P. D., Brennan, P. A., & Lilienfeld, S. O. (2011). Psychopathic traits and preattentive threat processing in children: A novel test of the fearlessness hypothesis. *Psychological Science*, 22(10), 1280–1287.
- Tanabe, J., Reynolds, J., Krmpotich, T., Claus, E., Thompson, L. L., Du, Y. P., et al. (2013). Reduced neural tracking of prediction error in substance-dependent individuals. *American Journal of Psychiatry*, 170(11), 1356–1363.
- Taylor, S. P. (1967). Aggressive behavior and physiological arousal as a function of provocation and the tendency to inhibit aggression. *Journal of Personality*, 35, 297–310.
- Viding, E., Sebastian, C. L., Dadds, M. R., Lockwood, P. L., Cecil, C. A., De Brito, S. A., et al. (2012). Amygdala response to preattentive masked fear in children with conduct problems: The role of callous–unemotional traits. *American Journal of Psychiatry*, 169(10), 1109–1116.
- Wallace, G. L., White, S. F., Robustelli, B., Sinclair, S., Hwang, S., Martin, A., et al. (2014). Cortical and subcortical abnormalities in youths with conduct disorder and elevated callous–unemotional traits. *Journal of the American Academy of Child and Adolescent Psychiatry*, 53(4), 456–465.
- White, S. F., Brislin, S. J., Meffert, H., Sinclair, S., & Blair, R. J. R. (2013). Callous–unemotional traits modulate the neural response associated with punishing another individual during social exchange: A preliminary investigation. *Journal of Personality Dis*orders, 27(1), 99–112.
- White, S. F., Brislin, S. J., Sinclair, S., & Blair, J. R. (2014). Punishing unfairness: Rewarding or the organization of a reactively aggressive response? *Human Brain Mapping*, 35(5), 2137–2147.
- White, S. F., Fowler, K. A., Sinclair, S., Schechter, J. C., Majestic, C. M., Pine, D. S., et al. (2014). Disrupted expected value signaling in youth with disruptive be-

havior disorders to environmental reinforcers. Journal of the American Academy of Child and Adolescent Psychiatry, 53(5), 579–588.

- White, S. F., Marsh, A. A., Fowler, K. A., Schechter, J. C., Adalio, C., Pope, K., et al. (2012). Reduced amygdala responding in youth with disruptive behavior disorder and psychopathic traits reflects a reduced emotional response not increased top-down attention to non-emotional features. *American Journal of Psychiatry*, 169(7), 750–758.
- White, S. F., Pope, K., Sinclair, S., Fowler, K. A., Brislin, S. J., Williams, W. C., et al. (2013). Disrupted expected value and prediction error signaling in youths with disruptive behavior disorders during a passive avoidance task. *American Journal of Psychia*try, 170(3), 315–323.
- White, S. F., Williams, W. C., Brislin, S. J., Sinclair, S., Blair, K. S., Fowler, K. A., et al. (2012). Reduced activity within the dorsal endogenous orienting of attention network to fearful expressions in youth with disruptive behavior disorders and psychopathic traits. *Development and Psychopathology*, 24(3), 1105–1116.
- Yang, Y., Raine, A., Colletti, P., Toga, A. W., & Narr, K. L. (2009). Abnormal temporal and prefrontal cortical gray matter thinning in psychopaths. *Molecular Psychiatry*, 14, 561–562.
- Yang, Y., Raine, A., Colletti, P., Toga, A. W., & Narr, K. L. (2010). Morphological alterations in the prefrontal cortex and the amygdala in unsuccessful psychopaths. *Journal of Abnormal Psychology*, 119(3), 546–554.
- Yang, Y., Raine, A., Narr, K. L., Colletti, P., & Toga, A. W. (2009). Localization of deformations within the amygdala in individuals with psychopathy. Archives of General Psychiatry, 66, 986–994.
- Yau, W. Y., Zubieta, J. K., Weiland, B. J., Samudra, P. G., Zucker, R. A., & Heitzeg, M. M. (2012). Nucleus accumbens response to incentive stimuli anticipation in children of alcoholics: Relationships with precursive behavioral risk and lifetime alcohol use. *Journal of Neuroscience*, 32(7), 2544–2551.
- Young, S. E., Friedman, N. P., Miyake, A., Willcutt, E. G., Corley, R. P., Haberstick, B. C., et al. (2009). Behavioral disinhibition: Liability for externalizing spectrum disorders and its genetic and environmental relation to response inhibition across adolescence. *Journal of Abnormal Psychology*, 118(1), 117–130.
- Yu, R., Mobbs, D., Seymour, B., Rowe, J. B., & Calder, A. J. (2014). The neural signature of escalating frustration in humans. Cortex, 54, 165–178.

# CHAPTER 18

# Cognitive and Emotional Processing in Psychopathy

CHRISTOPHER J. PATRICK

What deviations in neuropsychological systems and processes underlie the observable symptoms of psychopathic personality? This question has been a focal point of research on psychopathy since publication of the first experimental study in this area, by David Lykken (1957). The major lines of research undertaken to address this question have focused on abnormalities in sensitivity and responsiveness to emotional stimuli, or deviations in cognitive–attentional processing. This chapter reviews findings from these lines of research and considers them in relation to key developments in the psychopathy literature, with reference to an integrative conceptual framework for psychopathy—the triarchic model (Patrick, Fowles, & Krueger, 2009).

The chapter begins with a description of recent conceptual advances in the psychopathy literature that warrant attention in theorizing about neuropsychological "mechanisms."<sup>1</sup> Following this, I provide an overview of what is known about the functional role of specific brain systems/circuits in the types of cognitive and affective processes that appear most relevant to psychopathy. This is followed by a detailed review of studies that have investigated cognitive and emotional processing in individuals assessed for psychopathy—with particular emphasis on studies that have utilized neurophysiological measures and tested for processing deviations in relation to distinct subdimensions (facets) of psychopathy. The chapter concludes with a summary and conceptual integration of these different lines of research, with reference to the biobehavioral trait constructs of the triarchic model.

# **Recent Conceptual Advances** in the Psychopathy Literature

This section highlights notable conceptual shifts that have occurred in the literature on psychopathy, based on empirical findings from studies using contemporary assessment methods. Two of these, the concept of psychopathy as dimensional rather than typological and as multifaceted rather than unitary, were covered in my opening chapter for this volume, "Psychopathy as Masked Pathology"; the first of these points is revisited only briefly, whereas the second is discussed in an extended manner, with reference to the triarchic model of psychopathy (Patrick et al., 2009). Following this, two other major conceptual developments are considered.

# A Dimensional Perspective on Psychopathy

As I noted in Chapter 1, there is now a systematic body of research evaluating whether psychopathy as defined by contemporary assessment inventories is taxonic or dimensional. The weight of evidence strongly supports the view of psychopathy as continuous in nature (i.e., varying by degree across individuals) rather than discrete (i.e., either present or absent). Based on this, writers in the field are increasingly using terms such as "high-psychopathy individuals" and "psychopathic traits" in place of terms such as "psychopaths" and "core psychopathic symptoms." The view of psychopathy as continuous has implications for theorizing about "mechanisms": It suggests, contrary to the idea-espoused by Cleckley (1941/1976) and various others since—of a single underlying cause for the configuration of symptoms observed in psychopathy, that different etiological factors contribute in varying degrees to manifest psychopathic tendencies. This perspective on psychopathy also has implications for subject selection procedures: It calls for testing of individuals with continuously varying levels of psychopathic symptomatology in experimental research studies, in place of the traditional focus on discrete groups (i.e., "psychopathic" participants vs. "nonpsychopathic" or "healthy control" participants).

#### Psychopathy as Multifaceted

Another important shift in the field has been the recognition that psychopathy encompasses distinguishable symptom subdimensions, or facets (Hare, 2003; Patrick & Drislane, 2015), rather than comprising a single coherent continuum of symptomatology (see Part II, "Distinct Phenotypic Facets of Psychopathy"). The inventories now in widest use for assessing psychopathy all contain "factors" or "facets" reflecting psychologically distinct clusters of symptoms. The interview-based Psychopathy Checklist—Revised (PCL-R; Hare, 2003), and measures patterned after it, including the informant-rated Antisocial Process Screening Device (APSD; Frick & Hare, 2001), the questionnaire-based Self-Report Psychopathy Scale (SRP; Paulhus, Neumann, & Hare, 2015), and the Youth Psychopathic Traits Inventory (YPI; Andershed, Kerr, Stattin, & Levander, 2002), contain correlated factors/facets; their correlated nature reflects the fact that the PCL-R was originally developed to assess psychopathy as a unitary syndrome, using items that proved effective for differentiating groups diagnosed as "psychopathic" versus "nonpsychopathic" (Hare, 1980; see also Patrick, 2006).

Certain newer inventories, constructed without direct reference to the PCL-R, assess psychopathy in terms of subdimensions that are uncorrelated, or only weakly correlated. For example, the selfreport-based Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996; Lilienfeld & Widows, 2005) includes seven subscales that operate as indicators of two uncorrelated higher-order factors-Fearless Dominance (FD) and Self-Centered Impulsivity (SCI; or alternatively, Impulsive Antisociality [Benning, Patrick, Blonigen, Hicks, & Iacono, 2005])-and an eighth subscale, Coldheartedness, which indexes a third subdimension. The Triarchic Psychopathy Measure (TriPM; Drislane, Patrick, & Arsal, 2014) includes two uncorrelated subscales (Boldness, Disinhibition), along with a third (Meanness) that correlates to differing degrees with the others (i.e., moderately with Disinhibition, and modestly with Boldness).

The subdimensions of alternative psychopathy inventories, while exhibiting broad similarities, are far from identical in their item content and external correlates-posing challenges to integration of findings across studies that assess psychopathy in different ways. The triarchic model of psychopathy (Patrick et al., 2009) was formulated to address this problem. The model proposes that psychopathy, as described in various historic writings, and as assessed by different inventories, encompasses three distinct dispositional tendencies that account for its observable symptoms and correlates: boldness, involving social dominance, emotional stability/resilience, and venturesomeness; meanness, entailing deficient empathy (callousness), selfishness, and aggressive exploitation of others; and disinhibition, involving lack of behavioral restraint, irresponsibility, and emotional volatility. The TriPM was developed to assess psychopathy in terms of these distinct dispositions.

A growing body of evidence supports the view that the triarchic model dispositions are represented to varying degrees in alternative assessment instruments for psychopathy. The factors/facets of the PCL-R and some instruments patterned after it (e.g., SRP, YPI) reflect differing blends of these three dispositions (Drislane et al., 2014; Sellbom & Phillips, 2013; Venables, Hall, & Patrick, 2014; Wall, Wygant, & Sellbom, 2015). For example, the PCL-R's Interpersonal facet contains moderate representation of boldness and weaker representation of meanness and disinhibition, whereas its Affective facet contains moderate representation of meanness, modest representation of boldness, and limited representation of disinhibition. Other inventories patterned after the PCL-R, including the APSD and Levenson, Kiehl, and Fitzpatrick's (1995) primary-secondary psychopathy scales, include representation of disinhibition and meanness, but not boldness (Drislane et al., 2014; Sellbom & Phillips, 2013). By contrast, the three subdimensions of the PPI contain more differentiated coverage of the three triarchic model constructs: Its FD factor reflects boldness exclusively, its Coldheartedness subscale reflects meanness primarily, and its SCI factor indexes disinhibition most strongly and Meanness secondarily (Drislane et al., 2014; Sellbom & Phillips, 2013).

In addition to serving as conceptual referents for understanding the content coverage of different psychopathy inventories, the constructs of the triarchic model are also intended to facilitate efforts to relate the clinical concept of psychopathy to systems and processes in the domain of neurobiology-including cognitive and affective systems/processes. Along with having psychological meaning, the triarchic model constructs have direct neural and behavioral referents (Patrick et al., 2009; Patrick & Drislane, 2015; see also Patrick, Durbin, & Moser, 2012). The construct of boldness, as discussed further below, corresponds to a neurobehavioral dimension of threat sensitivity, presumed to reflect individual differences in reactivity of the brain's core defensive system-based in the amygdala and affiliated structures. The construct of meanness (or callousness-unemotionality; Frick & Marsee, Chapter 19, this volume; Frick, Ray, Thornton, & Kahn, 2014; Viding & Kimonis, Chapter 7, this volume) is theorized to reflect a biologically based predatory orientation involving aggressive resource seeking without concern for others (i.e., "disaffiliated agency"; Patrick, Drislane, & Strickland, 2012; Patrick et al., 2009). The third triarchic construct, disinhibition, corresponds to a neurobehavioral dimension of inhibitory control, presumed to reflect frontalbrain-based differences in the capacity to restrain behavior and regulate emotion in the service of nonimmediate goals (Nelson & Foell, Chapter 6, this volume; Patrick, Durbin, & Moser, 2012).

Importantly, the constructs of the triarchic model, as trait-dispositional constructs, also interface readily with well-established models of general personality—including the five-factor model (FFM; Costa & McCrae, 1992; John, Donahue, & Kentle, 1991) and Tellegen's (2011; Tellegen & Waller, 2008) multidimensional personality framework. For example, Poy, Segarra, Esteller, López, and Moltó (2014) reported that scores on the FFM factors accounted for substantial variance in each of the triarchic model constructs as indexed by the TriPM (see also Miller, Lamkin, Maples-Keller, & Lynam, 2016), and that, reciprocally, the TriPM's scales accounted for much of the variance in psychopathy-prototype scores computed from lowerorder facet traits of the FFM (cf. Miller, Lynam, Widiger, & Leukefeld, 2001). These findings indicate that the neurobehavioral constructs of the triarchic model can serve as referents for interfacing facets/factors of different psychopathy inventories with traits and dimensions of established personality models—and in turn with other forms of psychopathology, which have well-documented personality–trait correlates (e.g., Krueger, Caspi, Moffitt, Silva, & McGee, 1996; Markon, Krueger, & Watson, 2005; Trull, 1992, 1994; see also Kotov et al., 2017).

# Variants ("Subtypes") of Psychopathy

As described by Hicks and Drislane (Chapter 13, this volume), considerable research has documented the presence of distinct variants or "subtypes" of individuals exhibiting very high overall scores on psychopathy instruments such as the PCL-R, APSD, PPI, YPI, and TriPM. Though the existence of psychopathy subtypes has been a long-standing idea in the literature, dating back to the writings of Karpman (1941, 1948), most of the empirical work on this topic has been conducted quite recently-following a period of many years in which psychopathy was studied primarily as a unitary disorder, defined on the basis of global clinical ratings (cf. Hare, 1978), overall PCL/PCL-R scores (Hare, 1980, 1991, 2003), or omnibus self-report scale scores (e.g., Tharp, Maltzman, Syndulko, & Ziskind, 1980; Waid & Orne, 1982).

One major impetus for recent empirical work on subtypes was accumulating evidence for contrasting correlates of distinct subdimensions of psychopathy with external criterion measures. Of particular interest were findings of suppressor effects for psychopathy factors or facets in predicting certain external criteria. As an example, Factor 1 of the PCL-R, in particular its Interpersonal facet, shows larger negative correlations with anxious traits and anxious/depressive symptoms after controlling for its overlap with Factor 2-either through use of partialing (e.g., Hall, Benning, & Patrick, 2004) or structural equation modeling (e.g., Hicks & Patrick, 2006). Findings like this raised the question of whether some individuals attaining high overall scores on the PCL-R might exhibit tendencies akin to the correlates of Factor 1 (e.g., low anxiety/depression), whereas others would exhibit tendencies more akin to the correlates of Factor 2 (e.g., higher anxiousness, hostility, and substance-related problems). Results from empirical subtyping studies (see Hicks & Drislane, Chapter 13, this volume) have yielded consistent affirmative support for this idea. The finding of subtypes with contrasting personality profiles and clinical characteristics provides further reason to believe, as the triarchic model proposes, that different causal influences contribute to the observed behavioral phenomenon (phenotype) we call "psychopathy."

# Psychopathy and Development

Another key issue in theorizing about processing deficits or deviations in psychopathy, highlighted by the intense investigative focus on psychopathy in childhood and adolescence over the past two decades (see Chapter 19 by Frick & Marsee, and Chapter 20 by Salekin, Andershed, & Clark, this volume), is the role of development; that is, ideas about the causal bases of psychopathy need to accommodate what we know about the emergence and course of psychopathic tendencies across time and developmental periods. As discussed in sections below (and by Waldman, Rhee, LoParo, & Park, Chapter 14, this volume), psychopathic tendencies are appreciably heritable; however, it remains unclear (either genomically, or in biobehavioral terms) what is transmitted to make some individuals more apt to exhibit clinical psychopathy than others, and it seems clear that environment plays a critical role in the extent and manner of expression of genetic liability (Farrington & Bergstrøm, Chapter 15, this volume). Additionally, consistent with the developmental principle of equifinality, there appear to be different causal routes (pathways; Fowles, Chapter 5, this volume; Fowles & Dindo, 2009; Frick & Marsee, Chapter 19, this volume) to the reckless-impulsive behavioral deviancy that characterizes psychopathy. Furthermore, in reviewing evidence from experimental research studies that have sought to identify cognitive and affective processing "mechanisms" underlying psychopathic symptomatology, it must be borne in mind that these studies have been largely cross-sectional, and thus inherently correlational, in nature.

# Cognitive and Emotional Processing Systems: A Triarchic Model Perspective

As a point of reference for reviewing findings from studies of cognitive and affective processing in psychopathy, I provide a brief overview of relevant brain systems, considered in relation to the biobehavioral trait constructs of the triarchic model. This overview is intended to complement the detailed functional description provided by Blair, Meffert, Hwang, and White (Chapter 17, this volume), so I refer to material from their chapter here.

# **Core Affect Processing Systems**

As discussed by Blair and colleagues (Chapter 17, this volume), core brain circuits have been identified for threat and reward responding-based. respectively, in the amygdala and structures with which it connects, including the hypothalamus and periaqueductal (or "central") gray, and the midbrain dopaminergic system and striatal structures with which it interfaces, including the ventral tegementum, nucleus accumbens, and (via the nigrastriatal pathway) caudate nucleus. At a very basic level, priming of defensive-withdrawal or appetitive-approach behavior can occur through detection of conditioned cues in the environment that automatically activate these neural systems. In the case of defensive ("fear") responding, LeDoux (1995, 2000) described a "quick and dirty" processing pathway from the sensory thalamus that allows for crude acoustic information to be conveyed directly to the basolateral region of the amygdala (its sensory input subsystem), and from there to the amygdala's central nucleus (its action mobilization subsystem); through this neural pathway, the occurrence of a fear-conditioned tone (conditioned stimulus [CS]) can elicit defensive activation even following widespread lesioning of the neocortex. A fast-processing circuit of this type also exists for the visual system, from the thalamus to the basolateral nucleus of the amygdala (Davis & Lee, 1998); this circuit has been the focus of human studies investigating "unconscious" detection of visual fear cues, including phobic objects (Öhman, 1993) and fear-face stimuli (Whalen et al., 1998). Variations in sensitivity of the brain's core threat reactivity system are theorized to play a role in boldness as conceptualized within the triarchic model (Patrick et al., 2009; Patrick & Drislane, 2015). From this perspective, research employing measures known to index defensive action mobilization mediated by central amygdala activation, such as aversive startle potentiation (Davis, 1989; Lang, Bradley, & Cuthbert, 1990), have proven useful for testing hypotheses regarding boldness as a facet of psychopathy.

Along similar lines, Berridge and Robinson (1998) described the striatal dopaminergic system as having a low-level, preattentive processing capacity, through which simple environmental stimuli can elicit appetitive activation even without "conscious" awareness (see also Winkielman, Berridge, & Wilbarger, 2005). The role of dysfunction in this elemental reward circuitry has been examined in relation to disorders including substance abuse (Robinson & Berridge, 2000), attention-deficit/hyperactivity disorder (ADHD; Blum et al., 2008; Volkow et al., 2009), depression (Dunlop & Nemeroff, 2007; Pizzagalli, 2014), and schizophrenia (Howes & Kapur, 2009) more so than psychopathy. From the standpoint of the externalizing spectrum model (Krueger, Markon, Patrick, Benning, & Kramer, 2007; see also Nelson & Foell, Chapter 6, this volume), substance abuse and ADHD can be viewed as phenotypic expressions of a general disinhibitory liability in which basic reward-system dysfunction plays a codetermining role (Beauchaine & McNulty, 2013; Patrick, Foell, Venables, & Worthy, 2016). By contrast, from a triarchic model standpoint, the expression of disinhibitory liability in the direction of psychopathy is theorized to reflect deviations in systems for defensive ('fear') and empathic processing that contribute to fearless dominant (bold) and callous-unemotional (mean) features more unique to this condition (see Chapter 19 by Frick & Marsee, Chapter 8 by Lilienfeld, Watts, Smith, & Latzman, and Chapter 1 by Patrick, this volume; Venables et al., 2014).

However, as noted by Blair and colleagues (Chapter 17, this volume) and discussed in the next subsection, the core striatal dopaminergic reward system interfaces closely with frontal brain systems that operate to restrain and guide behavior in the service of goals and regulate emotional reactions—and that are theorized to be dysfunctional in high-disinhibited individuals. From this viewpoint, impairment in the normal interplay between core reward processes and frontal executive operations (e.g., disrupted prediction error signaling, as posited by Blair et al., leading to deficits in reinforcement learning; see also Nigg & Casey, 2005), may play an important role in the disinhibitory features of psychopathy.

The other core affect processing system highlighted by Blair and colleagues (Chapter 17, this volume), which is theorized to be particularly relevant to the meanness (callous–unemotional) construct of the triarchic model (Patrick & Drislane, 2015; Patrick et al., 2012), is the emotional empathy system, involving the amygdala, along with structures of the brain's pain processing network in particular, the anterior insula cortex and anterior cingulate cortex. Of note, it is the basolateral (sensory input) subdivision of the amygdala that has been specifically implicated in affective–face processing deficits associated with callous–unemotional features of psychopathy (Moul, Kilcross, & Dadds, 2012). Dysfunction in pain processing regions, on the other hand, is theorized to contribute to impairments in emotional sensitivity and responsiveness to physical discomfort on the part of others (Blair et al., Chapter 17, this volume).

# "Higher" Cognitive Processing Systems

Importantly, basic affect processing systems, as described earlier, operate in concert with "higher" cognitive systems by virtue of direct or indirect connections with other brain structures, including the hippocampus and diverse regions of neocortex. These neural connections provide avenues by which higher brain processes (e.g., memories, images, attentional "sets," expectancies, plans) can influence perception of and reactivity to emotional events, and in turn, by which emotional reactions can influence cognitive processing operations. Of particular importance to an understanding of psychopathic behavior are connections between core affective processing systems and regions of prefrontal cortex (PFC).

Broadly speaking, the PFC is theorized to be critical for "top-down" processing, defined as the guidance of behavior on the basis of internal representations of states or goals (Miller & Cohen, 2001). In particular, the PFC is believed to be important in novel or dynamic contexts, in which responding in an optimal way among competing alternatives is dependent on cognitive representations of goals/strategies rather than immediate stimulus input (e.g., Cohen & Servan-Schreiber, 1992; Wise, Murray, & Gerfen, 1996). Operating from this perspective, Miller and Cohen (2001) proposed a mechanistic model that characterizes the control functions of the PFC in terms of its specialized capacity to maintain goal representations in online performance contexts: By sustaining patterns of brain activation that correspond to goals and strategies for achieving them, the PFC transmits "biasing signals" to other brain regions with which it connects. These signals operate to prime sensory-attentional, associative, and motoric processes that support effective performance of a given task by directing activity along goalrelevant neural pathways.

The principal focus of Miller and Cohen's (2001) model was on *cognitive* control functions (i.e., guidance of behavior on the basis of semantic

representations) mediated by the dorsolateral PFC. This subdivision of the PFC plays a critical role in working memory processes, involving the maintenance of a discrete stimulus representation across a temporal delay (Goldman-Rakic, 1996) and also-as a function of its close connections with sensory association cortices and its projections to premotor and motoric output systems-in more active processes related to inhibition and regulation of behavioral responses (Petrides, 2000). For example, the dorsolateral PFC is known to play an important role in performance on the Stroop color-naming task (MacDonald, Cohen, Stenger, & Carter, 2000) and the visual antisaccade task (Broerse, Crawford, & den Boer, 2001; Müri et al., 1998)-which call for top-down inhibition of prepotent responses. Of note, individuals high on the disinhibition facet of psychopathy show impaired performance on these and other inhibitory control tasks (Venables et al., in press; Young et al., 2009).

As alluded to in the preceding section, the midbrain dopamine system also plays a critical role in Miller and Cohen's (2001) mechanistic account of cognitive-executive function. Considering that patterns of PFC activity pertinent to attainment of a goal must be reinforced in order to arise at appropriate times, these authors theorized that pathways from the midbrain dopamine system to the PFC, along with dopaminergic neurons within the PFC itself, serve this reinforcement function—by incentivizing PFC activation patterns that have previously facilitated goal attainment in particular task contexts. More specifically, the "incentive salience" (Berridge & Robinson, 1998) or "reward prediction error" function of the dopamine system (Blair et al., Chapter 17, this volume; Montague, Hyman, & Cohen, 2004) operates to strengthen connections between neurons that signal expectation of reward (i.e., based on contextual cues) and representations in the PFC that guide the actions required to achieve the reward. In this way, the dopaminergic activity supplies the motivational impetus for performance-facilitating PFC representations to recur in relevant task contexts. Montague al. hypothesized, in line with theorizing by Robinson and Berridge (2000), that the normal facilitative role of the dopamine system in performing activities that require intensive, sustained control (e.g., earning a college degree; multitasking in a job context) can be "hijacked" by psychoactive substances that acquire strong incentive salience and divert the functions of the PFC from longerrange adaptive actions toward behaviors that support immediate drug acquisition. Impaired PFC function that arises from, or in conjunction with, abnormalities in core reward circuitry may confer especially strong liability to substance use disorders (Patrick et al., 2016).

Miller and Cohen (2001) also devoted some attention in their model of "top-down" control to ventromedial and orbitofrontal subdivisions of the PFC, collectively termed the "orbitomedial PFC" by some authors (e.g., Blumer & Benson, 1975) in view of their strong interconnectedness. In turn, these regions connect directly and extensively with limbic structures, including the amygdala, hippocampus/perirhinal cortex, and hypothalamus, and as such, are theorized to play a more significant role than the dorsolateral PFC in the anticipation of affective consequences of behavior (Bechara, Damasio, Tranel, & Damasio, 1997; Wagar & Thagard, 2004) and the unlearning of stimulusreward associations (i.e., reversal learning; Dias, Robbins, & Roberts, 1996; Rolls, 2000). Additionally, a further important function that has been ascribed to the orbitomedial PFC is a major role in regulating emotional reactivity and expression. As illustrated by the well-known case of railway worker Phineas Gage, who suffered extensive damage to this portion of the PFC when an iron tamping rod was propelled up from the base through the top of his skull (Damasio, Grabowski, Frank, Galaburda, & Damasio, 1994), lesions of this brain region are associated with the emergence of hostileaggressive behavior, as well as impulsiveness and reckless irresponsibility (Blair & Cipolotti, 2000; Damasio, Tranel, & Damasio, 1990). Drawing on various lines of evidence, Davidson, Putnam, and Larson (2000) hypothesized that this region of PFC operates to down-regulate emotional activation elicited by cues signaling imminent reward or punishment, and that repeated engagement in angry aggression reflects impairment in the functioning of this system. Consistent with this view, a consistent finding in the literature is that there is a subgroup of impulsive-antisocial individuals who display—in contrast with the deficient emotional reactivity exhibited by antisocial individuals who exemplify core affective-interpersonal features of psychopathy-enhanced phasic reactivity to affective stressors or provocations (for a more recent review, see Patrick, 2014).

Miller and Cohen (2001) suggested a specific neural mechanism for the affective down-regulation described by Davidson and colleagues (2000), proposing that the orbitomedial PFC suppresses emotional reactivity through an inhibitory influence on limbic system neurons, exerted for the purpose of protecting goal-oriented processing against motivational interference in affectively charged contexts. How does the orbitofrontal PFC "know" when to exert this top-down regulatory influence? The impetus for this inhibitory control is presumed to come from activated goal representations that have power to bias competing neural pathways as a function of prior reinforcement and anticipated rewarding consequences of exerting such control. The dorsolateral cognitive control system, by virtue of its active maintenance capacity and connectivity with orbitomedial PFC, almost certainly plays a supporting role in this.

Two other brain regions that contribute to the regulation of emotional reactivity and behavior are the hippocampus and the anterior cingulate cortex (ACC). The hippocampus interfaces with the amygdala and midbrain dopamine system, along with the PFC, and is theorized to be important for linking affective responses and goals to complex stimulus configurations (contexts). For example, research has demonstrated a strong role for the hippocampus in spatial learning (Broadbent, Squire, & Clark, 2004), and lesions of the hippocampus block acquisition of contextual fear conditioning, though not simple cue conditioning (LeDoux, 1995). Cohen and O'Reilly (1996) theorized that neural connections between the hippocampus and PFC provide a mechanism by which goal representations can be activated dynamically by contextual cues in the environment to guide complex or delayed action sequences (e.g., remembering to stop at the grocery store after work to pick up items needed for dinner). From this perspective, impairments in hippocampal function would be expected to result in a simpler, immediate cue-driven mode of emotional processing and responding. The ACC, on the other hand, interfaces with premotor and supplementary motor regions, along with limbic structures (including amygdala and hippocampus) and PFC, and has been characterized as an error detection (Scheffers, Coles, Bernstein, Gehring, & Donchin, 1996) or conflict-monitoring system (Carter et al., 1998) that signals the PFC to exert cognitive control at times necessary to ensure optimal task performance. Accordingly, impairments in the functioning of the ACC are expected to result in problems inhibiting prepotent behavioral responses and an increased likelihood of repeating mistakes.

In summary, anterior brain circuitry, including the PFC and structures with which it interfaces (e.g., the hippocampus and ACC), appears critical for cognitive control and adaptive suppression of emotional reactivity. Based on available evidence, it can be expected that weakness or dysfunction in this circuitry would result in a general tendency to act in response to immediate cues and contingencies rather than on the basis of internal representations of goals and plans (Miller & Cohen, 2001). Dysfunction in the PFC and affiliated control systems would also compromise one's ability to anticipate and cope proactively with obstacles, and weaken the capacity to down-regulate immediate affective responses that have the potential to be maladaptive either in the near- or longer-term (Davidson et al., 2000; Rothbart & Sheese, 2007).

#### The Interplay between Cognition and Emotion

Material covered in the preceding section highlights the close interplay between cognitive and affective processing systems in guiding behavior in the dynamic situational contexts of everyday life. Laboratory research on brain operations mediating behavior tends to focus on the distinct roles of individual brain structures, or "circuits" comprising circumscribed sets of interconnected structures, in particular adaptive functions (e.g., appetitive or defensive action mobilization; "unlearning" of reward or punishment associations; inhibitory control of prepotent behavior). However, in naturalistic contexts, multiple brain regions operate in concert to process information and direct behavior. This "whole-brain" perspective is strongly emphasized, for example, in contemporary constructivist models of emotional processing (e.g., Barrett, 2017; LeDoux, 2015).

In the sections that follow, I discuss evidence regarding the role of three cognitive-affective processes in particular-inhibitory control, threat sensitivity, and empathic responding-in psychopathy. I discuss these processes specifically in relation to the dispositional constructs of the triarchic model. In doing so, I make the point that brain processes are not likely to operate in isolation from one another or map neatly onto observable symptoms/behavior patterns. The material presented in these sections intersects somewhat with information reviewed in other chapters of this volume (in particular, those by Blair et al. [Chapter 17], Fowles [Chapter 5], Frick & Marsee [Chapter 19], Hamilton & Newman [Chapter 4], Lilienfeld et al. [Chapter 8], Nelson & Foell [Chapter 6], and Viding & Kimonis [Chapter 7]). However, the emphasis in my review is on integrating findings from studies of different types using the triarchic model constructs as an interpretive frame of reference.

# Inhibitory Control and Externalizing Proneness (Disinhibition)

As discussed by Nelson and Foell (Chapter 6, this volume), the disinhibition construct of the triarchic model corresponds to the externalizing liability factor in the general psychopathology literature (Krueger et al., 2002, 2007), and it has well-established behavioral and neurophysiological correlates. These include impaired performance on inhibitory control tasks such as the Stroop interference, antisaccade, and stop-signal tasks (Young et al., 2009), and reduced amplitude of P3 brain potential response in tasks of different types including visual oddball, flanker discrimination, choice-feedback, and picture/startle tasks (Nelson, Patrick, & Bernat, 2011; Patrick et al., 2013; Perkins et al., 2017). Importantly, observed correlations of trait disinhibition with both behavioral performance and brain response measures of these types have been shown to be attributable in large part to common genetic influences (Yancey, Venables, Hicks, & Patrick, 2013; Young et al., 2009). The implication is that disinhibition-related deficits in performance on inhibitory control tasks and P3 brain response to task stimuli reflect underlying genetic liability for externalizing problems. As compelling evidence for this, using data from twins, Venables and colleagues (2017) demonstrated that a composite of trait scale and P3 brain indicators of disinhibition showed a moderate-level phenotypic association (r = .44) with substance abuse symptoms that were accounted for almost entirely (89% of covariance) by shared genetic influences; that is, the aggregation of scale and brain indicators of disinhibition into a composite yielded a purer index of genetic liability for externalizing (in this case, substance use) problems.

A limitation of P3 brain response as an indicator of trait disinhibition (and in turn externalizing liability) is that the neuropsychological meaning of its relationship with disinhibition is unclear. P3 response is affected by various parameters of a task (e.g., stimulus frequency and salience, processing demands, overall task context), and multiple brain structures contribute to generating it (Linden, 2005). Given this, along with the modest magnitude of the observed association between disinhibition and P3 amplitude (~-.2; Patrick et al., 2013;

Yancey et al., 2013), the variance in P3 response that reflects liability for externalizing problems could reflect any number of relevant neurocognitive processes. However, recent research provides evidence that trait disinhibition's relationship with P3 response reflects a process that contributes also to impaired performance on inhibitory control tasks. Specifically, Venables and colleagues (in press) collected data for multiple scale measures of trait disinhibition (cf. Patrick & Drislane, 2015), along with behavioral performance data from inhibitory control tasks and P3 brain response data from separate visual-motor tasks. Using structural equation modeling, these authors showed that measures from each response domain (scale, performance, brain) covaried together to form domain factors, and that these domain factors loaded in turn onto a higher-order, cross-domain disinhibition factor. The task-performance and P3 brain domain factors each loaded very highly on this cross-domain factor (-.60 and -.77, respectively), with the scale domain factor loading to a somewhat lesser degree (.40). The fact that the task performance and P3 brain variables loaded so strongly onto a common factor that accounted for their mutual associations with scale-assessed disinhibition indicates that the variance in P3 that relates to disinhibition reflects a process in common with that leading to impaired performance on inhibitory control tasks.

Importantly, reduced P3 amplitude has also been demonstrated in relation to disinhibitory features of psychopathy. Venables and Patrick (2014) examined P3 responses to target and novel stimuli in an oddball task in male criminal offenders assessed for psychopathy using the PCL-R. They found evidence of reduced amplitude of P3 response to stimuli of both types, specifically in relation to the impulsive-antisocial (Factor 2) component of the PCL-R, which indexes a construct highly similar to externalizing proneness (Patrick, Hicks, Krueger, & Lang, 2005). Carlson, Thái, and McLaron (2009) examined P3 reactivity in a two-stimulus visual oddball task in undergraduate participants assessed for psychopathic tendencies using the PPI. These authors reported a significant negative correlation between scores on the SCI factor of the PPI, which indexes impulsive-externalizing tendencies (Benning, Patrick, Blonigen, et al., 2005; Blonigen et al., 2005), and amplitude of P3 response to infrequent target stimuli at frontal recording sites. By contrast, no such association was evidence for the FD factor of the PPI, which indexes boldness.

What common disinhibition-related process might account both for reduced P3 brain response across visual-motor tasks of different types and impaired performance on cognitive control tasks such as Stroop, antisaccade, and stop-signal? Clues as to the nature of this process come from eventrelated potential (ERP) and neuroimaging studies of high-disinhibited individuals demonstrating dissociations in brain reactivity to stimuli of different types within a common task procedure. One study described by Patrick and Bernat (2009) reported a dissociation in the brain responses of high-disinhibited individuals to brief pictures presented as incidental novel stimuli in an oddball task: While showing generally reduced amplitude of delta-frequency P3 response to pictures in general, high-disinhibited individuals exhibited normally enhanced slow-wave ERP reactivity during viewing of affective (pleasant, unpleasant) as compared to neutral pictures. The authors' interpretation was that high-disinhibited individuals "show normal reactivity to immediate perceptual and emotional features of explicit stimulus events, but impaired elaborative-associative processing of stimulus input" (p. 241). In another study examining brain responses of high-disinhibited individuals to loss and gain feedback in a simulated gambling task, Bernat, Nelson, Steele, Gehring, and Patrick (2011) similarly reported normal reactivity to the affective component of feedback, as evidenced by a greater negative-going ERP deflection on loss versus gain trials (cf. Gehring & Willoughby, 2002), but diminished delta-frequency P3 response to feedback stimuli as a whole. Again, the authors interpreted these results as indicative of normal reactivity to immediate perceptual-motivational features of stimuli but impaired elaborative postprocessing of stimulus connotations in individuals high in disinhibitory tendencies.

Another dissociation in neural responses to visual stimuli within the same task procedure was reported in a recent functional magnetic resonance imaging (fMRI) study by Foell and colleagues (2016). These investigators examined brain reactivity during anticipation and subsequent viewing of picture stimuli in a procedure in which stimuli were presented in blocks of either aversive pictures interspersed with neutral ones, or pleasurable images interspersed with neutral ones. Participants were not told specifically what types of pictures they would see in each block, only that each picture stimulus would be preceded by an anticipatory cue signaling the upcoming presentation of the picture. However, across trials within a block, some subjects appeared more able than others to deduce which types of pictures they would see, as evidenced by greater nucleus accumbens (nAcc) activation (signifying heightened expectation of reward) during anticipatory intervals occurring within pleasant/neutral picture blocks as compared to aversive/neutral blocks. The degree of nAcc differentiation was correlated negatively with trait disinhibition scores, indicating that high-disinhibited subjects were less apt than lowdisinhibited subjects to develop awareness of the types of pictures being presented within a block. At the same time, there was a corresponding positive correlation between trait disinhibition scores and amygdala activation during subsequent viewing of pictures following the anticipatory interval. The implication is that high-disinhibited subjects showed greater limbic-subcortical reactivity to presentations of affective picture stimuli as a function of lesser anticipation of the nature of pictures to be viewed. Consistent with this interpretation, a statistical analysis of the interplay between the two brain effects revealed significant mediation of the positive correlation for trait disinhibition with amygdala response during viewing by its negative association with nAcc differentiation during anticipation.

The foregoing lines of evidence suggest that high-disinhibited individuals are deficient in elaborative-associative processing of ongoing stimuli within a task sequence and, as a function of this, are less able to discern implicit task contingencies and anticipate events. More specifically, Patrick and Bernat (2009) hypothesized that disinhibition involves a failure to link and integrate ongoing stimulus events and response outcomes with situation-relevant memory representations (including representations of goals and consequences), a normally automatic process that is crucial to anticipation, reflection, and self-regulation of emotion and behavior (Patterson & Newman, 1993). As a function of this, the processing style of high-disinhibited individuals is more immediate-stimulus driven (i.e., reactive and opportunistic, as opposed to mindful and strategic). This concept fits well with the description of the psychological consequences of anterior brain dysfunction presented in the preceding major section.

#### Synopsis and Perspective

Considering the evidence that high trait disinhibition entails an external cue-driven behavioral orientation related to impairments in executive function, together with research demonstrating very high heritability for variations in susceptibility to externalizing problems (Krueger et al., 2002; Yancey et al., 2013; Young, Stallings, Corley, Krauter, & Hewitt, 2000), it would be tempting to theorize that general externalizing proneness reflects a distinct, constitutional weakness in the neural integrity of the PFC control network. However, as discussed elsewhere (Patrick et al., 2016), the origins of control system dysfunction as a "mechanism" for externalizing proneness are likely complex rather than traceable to a specific etiological source. Consistent with this view, in a genomewide association study, McGue and colleagues (2013) found evidence for only a small number of individual gene variants (i.e., singlenucleotide polymorphisms; SNPs) contributing at nontrivial levels to externalizing problems of differing types; these investigators concluded that the heritable liability toward problems of this type (which they termed "behavioral disinhibition") reflects the impact of vast numbers of genes operating in combination. Given this, it may be more useful to conceive of externalizing proneness (disinhibition) as an emergent condition of control system dysfunction arising from alternative root sources that operate over the course of development to compromise the formation of frontal regulatory networks (cf. Nigg & Casey, 2005). Reduced P3 amplitude may serve as a neural indicator of the impaired elaborative-associative processing that characterizes this emergent condition.

What role does externalizing proneness conceptualized in this way play in psychopathy? From a triarchic model perspective, disinhibition must be accompanied by emotional detachment in the form of either boldness or meanness to be diagnosable as psychopathy. Given the evidence for a variant of psychopathy entailing impulsiveness, high overall negative affectivity, hostile aggression, and substance abuse (Hicks & Drislane, Chapter 13, this volume), it can be expected that a subset of individuals diagnosed as psychopathic according to the PCL-R or other assessment criteria will show evidence of control system dysfunction (e.g., impaired performance on inhibitory control tasks; reduced P3 amplitude; heightened reactivity to phasic stressors) as a basis for their disinhibitory behavior. Affective-interpersonal characteristics such as manipulation and deceptiveness, deficient remorse and empathy, and failure to accept responsibility for actions may arise secondarily to impulsive-externalizing tendencies in such individuals-that is, as a product of engagement in a deviant antisocial lifestyle involving repeated adversarial encounters with others (Fowles, Chapter 5, this volume; Lynam, 1996; Patrick et al., 2009).

On the other hand, available evidence indicates that other individuals with high overall psychopathy scores do not show clear evidence of control system impairment, as evidenced by historically mixed findings from studies examining relations of psychopathy with performance on executive function tasks (Morgan & Lilienfeld, 2000; Ogilvie, Stewart, Chan, & Shum, 2011) and P3 brain response (Gao & Raine, 2009). Consistent with points made in preceding sections, newer research has reported contrasting associations for affective-interpersonal and impulsive-antisocial components of psychopathy, when examined in continuous-score terms, with measures of these types (Pasion, Fernandes, Pereira, & Barbosa, 2017; Weidacker, Snowden, Boy, & Johnston, 2017). The implication is that individuals scoring predominantly high on affective-interpersonal features of psychopathy have normal or above-average frontal executive capacity, whereas those scoring predominantly high on impulsive–antisocial features have reduced frontal executive capacity. However, by definition, clinically psychopathic individuals exhibit high levels of both affective-interpersonal and impulsive-antisocial features. Considering evidence from trait- and symptom-based subtyping studies (Hicks & Drislane, Chapter 13, this volume), along with evidence for alternative developmental pathways to persistent antisocial behavior (see Fowles, Chapter 5, and Frick & Marsee, Chapter 19, this volume; Frick et al., 2014), other distinct "mechanisms" must contribute alongside disinhibitory liability, or in a primary manner, to full clinical cases of psychopathy. As discussed next, available evidence points to two "mechanisms" in particular: weak defensive reactivity, most clearly relevant to the boldness facet of psychopathy, and deficient empathic sensitivity, most relevant to the meanness (callous-unemotional) facet.

# Defensive Reactivity and Fearless Dominance (Boldness)

There is a long-standing idea in the literature that psychopathy involves a deficit in fear reactivity that weakens the ability to learn from punishment, a process considered critical to conscience development. Early research testing this hypothesis focused on behavioral tasks such as passive avoidance learning (e.g., Lykken, 1957; Schmauk,

1970) and aversive conditioning or cueing paradigms (e.g., Hare, 1965; Lykken, 1957), with recording of autonomic activity to index negative emotional reactivity. Findings from studies of offenders diagnosed as psychopathic revealed deficits in learning to avoid punished errors and reduced electrodermal reactivity to cues signaling aversive events, but normal (or in some cases enhanced; Hare, 1978) heart rate reactivity-which Fowles (1980) interpreted as indicative of a defective behavioral inhibition (punishment) system accompanied by a well-functioning behavioral activation (reward) system. At the same time, it bears noting that other work focusing on impulsive-antisocial individuals not necessarily high in affective-interpersonal symptoms of psychopathy documents normal or enhanced autonomic reactivity to emotional stressors in such individuals (for reviews, see Davidson et al., 2000; Patrick, 2014).

#### Affect Startle Modulation Studies

Since the early 1990s, a number of studies have been conducted using the affect startle modulation paradigm to test the hypothesis that psychopathic individuals are deficient in fear reactivity. As described by Lilienfeld and colleagues (Chapter 8, this volume), this task procedure involves recording startle eyeblink responses to incidental noise bursts presented while participants view emotional and neutral foreground stimuli. Many of the published studies examining startle modulation in psychopathy have used aversive and pleasurable pictures, along with neutral pictures, as foreground stimuli; a smaller number have used visual cues signaling whether a physically noxious stimuli (e.g., shock or loud noise) will occur or not in the current task trial. In studies of this type, blink-eliciting noises occur at unpredictable times during stimulus viewing intervals, and serve as probes of the ongoing affective-motivational state evoked by the foreground stimulus (e.g., picture or threat cue). A consistent finding in normative samples is that blinks elicited by noise probes presented during viewing of aversive pictures or threat cues are systematically larger than blinks elicited when viewing neutral pictures or nonthreat cues; by contrast, in studies using pictures, blinks are reliably smaller for probes that occur during viewing of pleasurable as compared to neutral pictures.

Based on extensive evidence from both animal and human research (Davis, 1989; Lang, Bradley, & Cuthbert, 1990), the increased startle-probe response during aversive stimulus viewing is understood to arise from a primed defensive action state that facilitates the protective blink reflex; as such, this augmentation effect has been termed "aversive startle potentiation" (Vaidyanathan, Patrick, & Bernat, 2009), or "fear-potentiated startle" (Davis, 1989). One major basis for inferring that startle reflex potentiation indexes defensive action mobilization is animal research demonstrating that enhanced startle during exposure to threat cues is mediated by a pathway from the central nucleus of the amygdala, the brain's "fear output" system, to the brainstem startle circuit. Another is that the increase in startle reactivity that occurs during aversive picture viewing is opposite in direction to the modulatory effect of foreground attentional engagement per se on startle (i.e., reflex attenuation; Simons & Zelson, 1985)-implying the impact of a process distinct from attention or arousal (Lang et al., 1990). Additionally, drugs that attenuate anxious arousal (e.g., diazepam) block the augmentation of startle that normally occurs in animals during exposure to shock-threat cues (Davis, 1989) or in humans during viewing of aversive pictures (Patrick, Berthot, & Moore, 1996).

An initial study by Patrick, Bradley, and Lang (1993) that examined startle modulation during affective picture viewing in male offenders assessed for psychopathy using the PCL-R reported an absence of aversive startle potentiation in those meeting full criteria for the diagnosis-indicating an absence of normal defensive action priming in response to threatening or disturbing images. A supplemental analysis comparing subgroups of offenders scoring equally high on PCL-R Factor 2 but differing on Factor 1 revealed inhibited startle during unpleasant picture viewing (relative to neutral) in the group scoring high on both factors, compared with robust potentiation in the high-Factor 2-only group. Patrick (1994) corroborated these findings using a noxious-noise-anticipation paradigm, reporting evidence for deficient startle potentiation during threat cueing in offenders scoring high on both factors of the PCL-R, or on Factor 1 alone. The implication is that reduced fear reactivity is associated specifically with the affective-interpersonal features of psychopathy. A subsequent picture viewing study by Levenston, Patrick, Bradley, and Lang (2000) presented evidence that the deviant startle pattern reported by Patrick and colleagues (1993) reflects a heightened threshold for shifting from attentional orienting to defensive mobilization (Fanselow, 1994; Lang et al., 1997) in high-psychopathic offenders. Offenders in this study who scored high on both PCL-R factors showed inhibited startle reactivity when viewing victimization scenes and only modest potentiation when viewing direct attack scenes (aimed weapons, menacing figures), whereas offenders scoring low on both factors showed moderate potentiation for victim scenes and strong potentiation for attack scenes. The implication is that it takes a stronger or more imminent threat to activate the defensive motivational system in high-psychopathic individuals.

This finding of a lack of startle potentiation during aversive picture viewing in offenders scoring high in PCL-R psychopathy has been replicated in numerous other studies, involving female (e.g., Sutton, Vitale, & Newman, 2002; Verona, Bresin, & Patrick, 2013) as well as male offender samples (e.g., Herpertz et al., 2001; Pastor, Moltó, Vila, & Lang, 2003; Vaidyanathan, Hall, Patrick, & Bernat, 2011). Studies among these that have examined effects separately for the two factors of the PCL-R (Vaidyanathan et al., 2011; Verona et al., 2013) have found the deficit in aversive startle potentiation to be associated selectively with Factor 1 (affective-interpersonal). Another study that examined startle modulation during picture viewing in employment-seeking adults from the community, assessed for psychopathy using the PCL-R, also reported a lack of aversive potentiation specifically in relation to Factor 1 symptoms (Vanman, Mejia, Dawson, Schell, & Raine, 2003).

Other research has examined affect-modulated startle in relation to scores on the uncorrelated FD and SCI factors of the PPI. In the first study of this type, Benning, Patrick, and Iacono (2005) reported inhibited rather than potentiated startle during aversive picture viewing in adolescent males scoring high on the PPI FD factor (estimated, in this case, from trait scales of the Multidimensional Personality Questionnaire [MPQ]; Tellegen & Waller, 2008); by contrast, no association was found for the PPI SCI factor (i.e., participants scoring high on this factor showed a similar degree of aversive startle potentiation as participants who scored low). Given evidence that PPI FD indexes boldness (Drislane et al., 2014; Sellbom & Phillips, 2013), this finding indicates a selective association of this psychopathy facet with aversive startle potentiation. Similar results were reported by Anderson, Stanford, Wan, and Young (2011) for a sample of undergraduate women assessed using the PPI-R. Another study by Justus and Finn (2007) yielded a partial replication (i.e., deficient aversive startle potentiation in relation to PPI-FD among male but not female participants, for noises occurring 2 seconds but not 4.5 seconds after picture onset).<sup>2</sup>

A study by Vaidayathan and colleagues (2009) provided evidence for a link between deficient startle potentiation during aversive picture viewing and a bipolar trait dimension of fear/fearlessness (Kramer, Patrick, Krueger, & Gasperi, 2012) or threat sensitivity (Yancey, Venables, & Patrick, 2016). These authors reported that the common factor underlying scores on the three PPI-FD scales, along with other widely used scale measures of fear and fearlessness, which they termed "trait fear," accounted for relations of each of the individual scale measures with aversive startle potentiation. Subsequent to this, Kramer and colleagues (2012) undertook a structural modeling analysis of these various fear/fearlessness scales in a mixedgender twin sample, and confirmed that they all operate as indicators of a common dispositional dimension—one that is moderately (~50%) heritable and indexed by aversive startle potentiation. Yancey and colleagues (2016) extended these findings, showing that other physiological indices of defensive activation during aversive picture viewing (heart rate increase, corrugator muscle tension) cohered together with startle potentiation and a scale measure of fear/fearlessness (designed to index the general factor of the Kramer et al., 2012, model, and correlating ~ -.8 with PPI-FD and TriPM Boldness) around a common dimension, which they interpreted as a cross-domain continuum of threat sensitivity (i.e., reflecting individual differences in proneness to exhibit defensive action mobilization in response to explicit aversive cues).

Other studies by Newman and colleagues have examined startle potentiation under conditions of shock threat in male offenders assessed for psychopathy using the PCL-R; these studies have compared reactivity of high and low psychopathy scorers under conditions of simple shock cuing and shock cueing with distraction (i.e., in which the shock cue is incidental to an attended target stimulus calling for a response). In the first of these studies, Newman, Curtin, Bertsch, and Baskin-Sommers (2010) reported deficient startle potentiation in high-psychopathy European American offenders in the cueing-with-distraction condition but not in the simple shock-cueing condition; reduced potentiation in the distraction condition was found in relation to PCL-R scores as a whole, not in relation to Factor 1 or Factor 2 specifically. In a second study, focusing on African American rather than European American offenders, Baskin-Sommers, Newman, Sathasivam, and Curtin (2010) found no association between psychopathy scores and startle potentiation in either task condition. In a third study, utilizing a different sample of male European American offenders, Baskin-Sommers, Curtin, and Newman (2011) found deficient startle potentiation for high-psychopathy participants in the cuing-withdistraction condition only—but, in this case, in relation to PCL-R Factor 1 scores specifically.

Findings from these studies are challenging to integrate with findings from the larger number of studies that have examined effects of psychopathy on startle modulation during viewing of affective pictures. In particular, it is not clear how variations in startle potentiation during shock cueing, with or without distraction, relate to individual differences in startle potentiation during aversive picture viewing because no studies to date have compared startle potentiation scores for these two procedures across individuals within the same participant sample.<sup>3</sup> However, there are reasons to suspect that startle potentiation in the cueingwith-distraction condition used by Newman and colleagues may index variations in defensive reactivity more similarly to startle potentiation during aversive picture viewing than potentiation in their simple shock-cueing condition. Potentiation of startle to an incidental aversive cue during performance of an engaging visual task indicates automatic detection of the threat value of the cue, and consequent defensive action priming, despite allocation of resources to processing the primary task foreground (Cornwell et al. 2011); similarly, potentiation of startle during viewing of an engaging aversive picture signifies automatic threat detection and defensive priming despite allocation of resources to processing the content of the foreground image (Lang et al., 1997; Levenston et al., 2000). By contrast, startle potentiation during simple shock-cueing may reflect processes other than defensive action mobilization, such as heightened alertness to the possible occurrence of a noise probe—since processing resources are not constrained by task demands (Bradley, Zlatar, & Lang, 2018). The implication is that, for human participants, startle potentiation in tasks in which threat cues occur during foreground attentional engagement may be more sensitive to individual differences in defensive ("fear") reactivity than startle potentiation in simple threat-cueing tasks.

Consistent with this viewpoint, Dvorak-Bertsch, Curtin, Rubinstein, and Newman (2009) tested nonoffender participants using the same task employed by Newman and colleagues (2010) and found deficient startle potentiation for individuals scoring high on the PPI-FD—as has been reported within the picture-viewing paradigm—in the cueing-with-distraction condition of the task, but not in the simple shock-cueing condition. Also consistent with this view, alcohol and anxiolytic drugs have been found to attenuate startle potentiation during viewing of aversive pictures (Donohue, Curtin, Patrick, & Lang 2007; Patrick et al., 1996) and under conditions of threat cueing with distraction (Curtin, Patrick, Lang, Cacioppo, & Birbaumer, 2001), but not under conditions of simple threat cueing (Baas et al., 2002; Curtin, Lang, Patrick, & Stritzke, 1998; Curtin et al., 2001).

In summary, a considerable body of research utilizing the affect startle modulation paradigm provides consistent and compelling evidence that psychopathy involves reduced sensitivity to threat cues, indicative of a weakness in (Lykken, 1995), or heightened threshold for reactivity of (Levenston et al., 2000), the brain's defensive motivational system. Studies that have tested offenders assessed for psychopathy using the PCL-R indicate that this reduced sensitivity to threat cues is related in particular to the affective-interpersonal features of psychopathy. Studies with nonoffenders that have used actual or estimated scores on the PPI to assess for psychopathy have shown reduced threat sensitivity to be related selectively to fearless dominance (or boldness; Lilienfeld et al., Chapter 8. this volume; Patrick et al., 2009), which comprises the low pole of a trait dimension that represents the psychological counterpart to a continuum of physiological defensive reactivity (Kramer et al., 2012; see also Yancey et al., 2016). As I discuss in the final section of this chapter, it may be fruitful to begin incorporating physiological indicators of defensive reactivity, such as aversive startle potentiation, into research diagnostic assessments in order to demarcate a bold, fearless variant of psychopathy more effectively.

#### **Other Research Paradigms**

Another approach that has been used to test for deficits in defensive (fear) reactivity in psychopathic individuals is aversive classical conditioning. Following up on early findings of reduced electrodermal conditioning to cues signaling aversive outcomes in participants diagnosed as psychopathic (e.g., Lykken, 1957; Ziskind, Syndulko, & Maltzman, 1978), Flor, Birbaumer, Hermann, Ziegler, and Patrick (2002) reported evidence of a lack of differential conditioning in multiple response systems (i.e., startle blink, facial corrugator, and late-interval electrocortical, along with electrodermal) to a cue preceding the occurrence of a noxious-odor stimulus (CS+) relative to a nonsignal cue (CS–) in high-psychopathic individuals compared to nonpsychopathic controls—despite normal early electrocortical reactivity indicating intact perceptual registration of cues. A novel feature of this study was that participants in the psychopathic group were nonoffenders recruited in specialized ways from the community and assessed using the PCL-R; all members of this group scored above the mean on Factor 1 of the PCL-R, and at or above the mean on Factor 2.

Largely similar results were obtained in a separate study by Rothemund and colleagues (2012), who compared conditioning to a cue that predicted shock in offenders assessed for psychopathy using the screening version of the PCL-R with nonoffender controls; offenders in this study were selected to be high in Factor 1 features of psychopathy (i.e., equal to or greater than two-thirds of maximum score) without regard to scores on Factor 2. López, Poy, Patrick, and Moltó (2013), utilizing an undergraduate sample, reported reduced electrodermal conditioning to a cue signaling shock in relation to scores on the FD factor of the PPI-R, with no relationship evident for the SCI factor. Dovetailing with these results, Dindo and Fowles (2011) reported (also in an undergraduate sample) reduced electrodermal reactivity during cued anticipation of a noxious noise stimulus in relation to scores on the PPI-FD but not the PPI-SCI factor.

In addition, some research has used fMRI to examine activity in different brain regions during aversive conditioning in high-psychopathic as compared to low-psychopathic individuals. Birbaumer and colleagues (2005) examined brain reactivity in a differential aversive conditioning procedure using painful tactile pressure as the unconditioned stimulus and reported decreased activation to CS+ versus CS- stimuli for male psychopathic offenders in left amygdala and ventromedial PFC regions, as well as in right insula, rostral anterior cingulate, and secondary somatosensory cortex. Participants in this study were defined as psychopathic primarily on the basis of elevations on PCL-R Factor 1 (i.e., scores equal to or greater than two-thirds of the maximum for this factor). In stark contrast, Schneider and colleagues (2000) tested men identified as having antisocial personality disorder (without regard to Factor 1 symptoms) in a similar conditioning procedure involving a noxious odor as the aversive stimulus, and reported *increased* activation in amygdala and dorsolateral PFC regions to the CS+ versus the CS- relative to healthy controls. These results converge with the previously noted result indicating enhanced autonomic reactivity to emotional stressors in antisocial individuals not displaying core affective–interpersonal features of psychopathy.

Other studies have used neuroimaging methods to examine brain reactivity to aversive stimuli in individuals assessed using the PCL-R (or its Screening Version) within assorted nonconditioning paradigms; most of these have used small samples characterized only in terms of total psychopathy scores (not factors or facets), resulting in mixed findings that are difficult to interpret (for reviews, see Blair et al., Chapter 17, this volume; Patrick, 2014; Patrick, Venables, & Skeem, 2012). A smaller number of other investigations have used fMRI to examine neural reactivity to negative emotional stimuli in nonoffenders assessed for psychopathy using the PPI. One of these (Gordon, Baird, & End, 2004) reported that individuals high on the PPI's FD factor (relative to those low on PPI-FD) showed decreased activation to fearful, angry, sad, and joyful faces in affect-processing regions including the amygdala, while showing enhanced activation in visual cortex and right dorsolateral PFC-indicating intact perceptual registration of stimuli. By contrast, individuals scoring high on PPI-SCI showed enhanced amygdala activation in response to affective face stimuli compared to those scoring low on this PPI factor.

In addition, some studies have examined brain reactivity of younger participants, assessed using age-adapted variants of the PCL-R (see Salekin, Andershed, & Clark, Chapter 20, this volume), to affective facial stimuli, including fearful faces. These studies have generally found effects in relation to the callous-unemotional (meanness) component of psychopathy and are thus considered in the next section. It should be noted that negative emotional faces, in particular, fear faces, reliably activate the amygdala more strongly than neutral face or non-face stimuli (Whalen et al., 1998). However, studies that have examined reactivity to noise probes presented during simple viewing of face stimuli have not revealed startle blink potentiation in response to fearful faces in comparison to neutral faces. The implication is that fearful faces activate the basolateral input subdivision of the amygdala, but not the central output subdivision. As such, amygdala reactivity in response to fearful faces has been interpreted as reflecting sensitivity to the distress of others (Moul et al., 2012), more so than defensive action mobilization.

# Synopsis and Perspective

Considerable evidence exists for a role of deficient defensive ("fear") reactivity in psychopathy, particularly in relation to the core affective-interpersonal features. Studies employing the affect startle modulation paradigm have reliably demonstrated a lack of normal blink reflex potentiation during aversive cueing-indicating a failure of threat signals to trigger defensive action mobilization-in offenders and nonoffenders scoring high on these symptomatic features. Work with nonoffender samples has shown that aversive startle potentiation operates as an indicator of a trait dimension of fear/fearlessness, whose low pole reflects boldness, a construct that relates to Factor 1 of psychopathy as assessed by the PCL-R—in particular, its Interpersonal facet (Venables et al., 2014; Wall et al., 2015). Recent research using other tasks that have shown psychopathy-related effects in offender samples (e.g., aversive classical conditioning, noxious stimulus anticipation) have found similar effects for nonoffenders scoring high on the FD factor of the PPI, which directly indexes boldness (Drislane et al., 2014; Sellbom & Phillips, 2013).

Taken together, these findings point to a contribution of defensive reactivity deficits, linked to a normative individual-difference dimension of fear versus boldness, in psychopathy. However, the role of weak defensive reactivity in the overall symptom picture of clinical psychopathy (e.g., as assessed by the PCL-R) is likely complex and nuanced rather than simple and clear-cut. The relationship between normative fear/boldness and the Factor 1 component of PCL-R psychopathy (see Venables et al., 2014; Wall et al., 2015) is only moderate (r  $\sim$  .3) perhaps due in part to assessment mode differences (Blonigen et al., 2010), and attributable mainly to Interpersonal symptoms, and it remains unclear whether startle effects for PCL-R Factor 1 are related mainly to this symptom facet or as much (or more to) the PCL-R's Affective facet.

Furthermore, though variations in fear versus boldness are moderately heritable (Blonigen et al., 2005; Kramer et al., 2012), this heritability reflects the influence of many genes operating in concert rather than large effects of a small number of specific genes. As evidence for this, Verweij and colleagues (2010) undertook genomewide association analyses for scores on traits from Cloninger's (1987) well-known temperament model, and found no appreciable effects of individual gene variants (SNPs) for any of these traits-including Harm Avoidance, a broad trait whose facets load, together with scales comprising the PPI's FD factor, onto a bipolar factor of Fear/Fearlessness (Kramer et al., 2012). Relatedly, another genomewide analvsis study by Otowa and colleagues (2016) focused on general proneness to fear-related disorders (i.e., specific and social phobia, panic disorder, and agoraphobia, along with generalized anxiety disorder) and found significant effects of very modest size (i.e., accounting for minute portions of variance) for only a small number of individual gene SNPs. The implication is that variations in many aspects of the genome contribute, in combination with environmental influences across time, to an individual's level of dispositional fear and degree of susceptibility (vs. immunity) to fear-related problems. In turn, genes from among the large array that dispose toward low fear may combine with genes for other liability factors (e.g., externalizing proneness, and or low empathic sensitivity, considered next) to give rise, in concert with environmental influences across time, to differing expressions of psychopathic symptomatology.

# Empathic Sensitivity and Callousness– Unemotionality (Meanness)

The other "mechanism" that has been posited to account for the clinical symptom picture of psychopathy, in particular its distinct affective-interpersonal features, is a lack of sensitivity to the feelings and welfare of other people. While some historical conceptual writings on psychopathy differentiated between capacities for empathy and threat reactivity (e.g., McCord & McCord, 1964), the empirical literature for many years-perhaps due to the influence of seminal laboratory studies by Lykken and Hare in the late 1950s and 1960s/1970s, respectively—connected the concept of an empathic deficit in psychopathy to the hypothesis of a more general weakness in anxiousness or fear. Central to this perspective was the notion that a constitutional weakness in fear limits the capacity to develop conditioned affective responses to punishment cues, considered essential to the internalization of rules/norms ("socialization"; Gough, 1960; Lykken, 1995) and normal formation of conscience (Kochanska, 1997). Since concern for others is part of what "conscience" is presumed to encompass, it was plausible to view deficient empathy as arising from the deficits in fear reactivity and aversive learning spotlighted by early experimental studies.

# Physiological and Behavioral Reactivity to Distress Cues

A major impetus for current research focusing on empathic processing as distinct from fearfulness or threat sensitivity was work by Blair and colleagues in the mid-1990s demonstrating, in adult offenders identified as psychopathic using the PCL-R, anomalies in judging text descriptions of moral transgressions (Blair, 1995) and weak electrodermal reactivity in relation to visual depictions of others' distress (i.e., photographic images of younger and older people crying or screaming; Blair, Jones, Clark, & Smith, 1997). Of note, participants in these studies were classified as psychopathic versus nonpsychopathic using PCL-R scores as a whole, derived from file records alone, and in the earlier study by Blair (1995), three of four Interpersonal items were excluded from computation of PCL-R scores due to insufficient file information; the implication is that results from these studies likely reflect callous and impulsive-aggressive (meandisinhibitory) features of psychopathy indexed by the PCL-R as a whole (Patrick, Hicks, Nichol, & Krueger, 2007; Patrick et al., 2009) more so than glib/grandiose/manipulative features related to boldness.

Operating from these findings, Blair (1995; Blair et al., 1997) postulated that psychopathy entails a deficit in the capacity for empathy (defined as "an emotional reaction to a representation of the distressed internal state of another"; Blair, 1995, p. 4) attributable to a constitutional or acquired weakness in a species-adaptive neurocognitive process termed the "violence inhibition mechanism," which operates automatically in normal individuals to terminate mobilization for aggressive attack in response to distress cues emitted by the object of the attack. In subsequent studies, Blair and his colleagues tested for deficits in reactivity to distress cues in younger participants assessed for psychopathy using youth-adapted versions of the PCL-R. Blair (1999) compared electrodermal responses of three groups of young adolescent males (mean age ~ 13 years)—two exhibiting "emotional and behavioral difficulties" but distinguished by high versus low levels of psychopathy, as indexed by teacher-rated APSD scores (named the Psychopathy Screening Device at the time), and a third nonclinical control group—to photographic images depicting directly threatening stimuli, other people in distress, and neutral scenes. The major finding was reduced electrodermal reactivity both to direct threat scenes and other distress scenes in the high-psychopathy clinical group compared with the other two groups; examination of results for the two distinct factors of the APSD revealed reduced physiological reactivity primarily in relation to Factor 1 scores, which reflect callous–unemotional tendencies (meanness; Patrick et al., 2009).

In a subsequent study, Blair and Coles (2000) examined recognition accuracy for emotional faces of different types (fearful, sad, angry, disgusted, surprised, happy) in male and female children ages 11–14, recruited from an urban community school and assessed for psychopathy using the APSD. Analyses revealed that higher overall psychopathy scores were associated with lower accuracy in recognizing negative emotional faces-fearful faces in particular, but also sad and angry expressions to lesser significant degrees. Analyses for the two factors of the APSD revealed significant negative correlations for Factor 1 with recognition of fearful and sad faces, and a significant negative r of similar magnitude for Factor 2 with recognition of fearful faces, but not sad faces (p = .09). A key limitation of this study was that participants were nonclinical schoolchildren, resulting in a limited number of high APSD scorers in the sample and a very strong correlation between scores on the two APSD factors (r = .79).

In another study, Blair, Colledge, Murray, and Mitchell (2001) compared accuracy of affective face recognition in subgroups of male youth (mean age ~ 13) exhibiting emotional and behavioral problems, one consisting of very high scorers on the APSD as a whole (teacher ratings of 28 or above; mean total score = 31.6) and the other consisting of very low APSD scorers (17 or below; mean total score = 7.6). Replicating the findings of Blair and Coles (2000), these authors found reduced recognition accuracy for both fearful and sad expressions in the high-psychopathic versus the low-psychopathic group. However, given the extreme group design involving subsets of participants who differed substantially on both factors of the APSD, it was not possible to evaluate effects for callous-unemotional and impulsive/conduct problem symptoms separately. Stevens, Charman, and Blair (2001), also using an extreme clinical groups design, likewise showed reduced recognition accuracy for fearful and sad faces in male youth scoring high versus low on the APSD, along with reduced accuracy in recognizing sad vocalizations relative to happy and angry vocalizations an effect demonstrated for fearful vocalizations in subsequent extreme-group studies conducted with youthful (Blair, Budhani, Colledge, & Scott, 2005) and adult clinical participants (Blair et al., 2002). By contrast, a study of adult male offenders assessed using the PCL-R reported reduced recognition accuracy for fearful but not sad (or other) faces in high- versus low-psychopathic groups.

Drawing on findings from the foregoing face recognition studies, along with published work pointing to deficits in subcortical affect-processing systems in psychopathy, Blair (2007) advanced an "integrated emotion systems" model in which specific impairment in the amygdala-mediated capacity to form stimulus reinforcement associations was posited to account for symptomatic features and observed processing deficits in psychopathy. From the perspective of this model, it was predicted that reduced affective face recognition in psychopathy (for fear faces in particular; Marsh & Blair, 2008<sup>4</sup>) would be associated with reduced amygdala reactivity to affective (especially fearful) face stimuli. Evidence directly supporting this hypothesis was provided by Marsh and colleagues (2008), who used fMRI to compare brain reactivity to fearful and neutral faces in three groups of adolescent males (mean age  $\sim$  14): (1) individuals diagnosed with conduct disorder or oppositional defiant disorder who also attained scores at or above the midpoint on both the APSD and the youth version of the PCL-R (Forth, Kosson, & Hare, 1996/2003); (2) individuals meeting diagnostic criteria for ADHD, but not conduct or oppositional defiant disorder; and (3) nonclinical controls. The major finding of this study was that participants in the first of these groups, relative to the other groups, showed decreased right amygdala activation, along with reduced covariation ("functional connectivity") of the right amygdala with some brain regions (e.g., ventromedial PFC, anterior insula/claustrum, inferior temporal and fusiform gyri) and increased covariation with others (middle frontal gyrus, thalamus). Corroborative results were reported soon afterward by Jones, Laurens, Herba, Barker, and Viding (2009). Using a highly similar task procedure and a younger sample (mean age = 11 years) consisting of participants selected to be either high on callous-unemotional traits and impulsive conduct problems or low on both, these investigators replicated Marsh and colleagues' (2008) finding of decreased right amygdala activation during processing of fearful versus neutral faces in the high-callous/high-conduct problem group.

Although Marsh and colleagues (2008) and Jones and colleagues (2009) inferred that the presence of callous-unemotional traits was particularly important to the finding of reduced amygdala response to fearful faces, firm conclusions were not possible because comparison groups in these studies differed on both callous-unemotional traits and conduct problems. However, in a subsequent study, Viding and colleagues (2012) provided clear evidence for the importance of callous-unemotional features to this effect. This study contrasted three groups of adolescent participants (mean age ~ 14), two exhibiting salient conduct problems but differing in levels of callous-unemotional traits (i.e., high vs. low), and a third exhibiting low levels of both attributes. A further notable feature of this study was that fearful and neutral face stimuli were presented under backward masking conditions designed to limit conscious processing of the stimuli. Consistent with the findings of Marsh and colleagues (2008) and Jones and colleagues (2009), Viding and colleagues reported decreased right amygdala reactivity in response to fearful faces (relative to neutral) in the high-callous/highconduct problem group compared to the nonclinical control group; by contrast, the low-callous/ high-conduct problem group showed increased right amygdala reactivity to fear faces compared to control subjects. The finding that the high-callous group showed reduced amygdala reactivity even to backwardly masked fear faces lends weight to the idea that psychopathy involves dysfunction at this basic subcortical level. In addition, the finding of elevated reactivity for the low-callous conduct problem group, which accords with other work showing enhanced reactivity to phasic stressors in antisocial individuals lacking in core psychopathic features (Davidson et al., 2000; Patrick, 2014), provides evidence that reduced amygdala reactivity to distress cues is specific to the callous-unemotional (meanness) facet of psychopathy.

Other fMRI studies have further replicated and extended this finding of reduced amygdala reactivity to fear faces in relation to the callous–unemotional facet of psychopathy. White, Marsh, and colleagues (2012) compared psychopathic (high callous/high conduct problem) and healthy control groups in terms of reactivity of the amygdala and frontal control structures (dorsolateral and medial PFC) to fearful versus neutral faces under conditions of high and low attentional load. The psychopathic group showed reduced amygdala reactivity to fearful faces, particularly in the lowload condition, with no evidence of differential activity in frontal control regions-providing evidence that the affective processing deficit in this group was not attributable to enhanced top-down attentional control. In another study, White, Williams, and colleagues (2012), following up on work by Dadds, El Masry, Wimalaweera, and Guastella (2008) demonstrating that fear face recognition deficits in high-psychopathy youth were associated with reduced attention toward the eye region of stimulus faces, found that adolescents high in both callousness and conduct problems did not exhibit normal dorsal/frontoparietal brain activation in response to attentional cueing by the eye gaze of fearful face stimuli. The authors' interpretation was that reduced attention to the eye region of fearful faces in high-psychopathic individuals is a consequence rather than a cause of deficient affective processing.

In another more recent study, Brislin and colleagues (2017) provided a constructive replication (cf. Lykken, 1968) of this finding of reduced subcortical brain response to fearful faces in youth with conduct problems exhibiting callous-unemotional features of psychopathy. Using adult participants (mean age = 29 years) and drawing on research demonstrating differential reactivity to fearful versus neutral faces in two components of the face-elicited ERP, the temporal-parietal N170 and the parietal P2 (Paulmann & Pell, 2009; Shannon, Patrick, Venables, & He, 2013), Brislin and colleagues tested the hypothesis that degree of fear/neutral differentiation for these face-ERP components would covary with levels of callousness assessed using a 25-item variant of the TriPM Meanness scale.<sup>5</sup> Consistent with this hypothesis, higher callousness predicted less fear/neutral differentiation for both N170 and P2 response variables. Of note, callousness scores in this study were quite highly correlated (r > .6) with disinhibitory tendencies, as indexed by a 30-item version of the TriPM Disinhibition scale; however, when scores for both traits were entered into regression models predicting N170 and P2 variables, callousness alone emerged as predictive of reduced brain response. Of note, this was particularly the case for P2, for which fear/neutral differentiation is most clearly heritable (Shannon et al., 2013)-and for this ERP variable, a suppressor effect was evident for the two psychopathy facets (i.e., controlling for their overlap in a joint regression model, the association for callousness with P2 became more negative, whereas the association for disinhibition went from modestly negative to modestly positive). This observed effect fits with the finding of enhanced versus reduced amygdala reactivity to fear faces for youth with conduct problems exhibiting low as compared to high levels of callous–unemotional traits.

What does the relationship of callous-unemotional traits with reduced fear face recognition and responsiveness signify in cognitive-affective processing terms? Moul and colleagues (2012), in line with Blair's (1995) idea that the core symptoms of psychopathy reflect a brain-based deficit in sensitivity to distress cues, postulated that impaired fear face recognition/response reflects dysfunction in the basolateral input subdivision of the amygdala that disrupts automatic processing of the main distress-signaling element of fearful expressions (i.e., widened eyes). These authors suggested more broadly that dysfunction in this component of the amygdala prevents normal reflexive orienting to fear-related stimuli in general, and as a consequence impairs fear learning and sensitivity to others' distress. Citing evidence from various sources, including visual flash-suppression studies, Blair and colleagues (Chapter 17, this volume) attribute this lack of reflexive orienting to fear cues to a deficit in the core affect-processing function of the amygdala that mediates normal "bottom-up" motive-driven attention (cf. Bradley, 2009; Lang et al., 1997); operating from this perspective, these authors discuss affect-processing dysfunction of this type (along with dysfunction in pain processing circuitry; see the next subsection) as a "mechanism" for impaired emotional empathy in particular. Additionally, Blair and colleagues (Chapter 17, this volume) address the finding of enhanced amygdala response to fear faces in antisocial individuals who lack callous-unemotional symptoms (Viding et al., 2012), suggesting that this response pattern reflects dysfunction in neural circuits that operate to regulate "bottom-up" reactivity to physical and social threat cues.

#### Pain Processing

Another neural system that has been posited to play an important role in the capacity for empathy is the brain's pain processing network. As noted by Decety (2011), evidence from different sources, including human fMRI studies, indicates that the neural circuitry for vicarious pain experience (i.e., emotional sensitivity to pain on the part of other others) overlaps substantially with the circuitry for personal pain processing (i.e., one's own experience of noxious stimulation). This circuitry encompasses a number of structures, including the amygdala, dorsal and anterior medial portions of cingulate cortex, anterior insular cortex, periacqueductal gray, and the supplementary motor area (SMA). Of note, structures comprising this network are implicated in other emotional states, including fear, anger, and general empathic reactivity; however, the structures that appear most specific to processing of noxious stimuli and painrelated cues are the anterior insular cortex and the medial ACC (Decety, 2011).

If psychopathy involves deficient sensitivity to the pain of others, one would expect to see reduced activation of structures in this brain network—particularly the anterior insula and ACC, along with the amydala, with which the ACC interfaces in processing pain-related cues-when viewing depictions of others in pain. As noted by Blair and colleagues (Chapter 17, this volume), empirical evidence for this hypothesis has been mixed. Some studies that have assessed activity in these brain structures during vicarious pain processing have examined effects for participant groups differentiated globally-that is, by the presence versus absence of conduct disorder (Decety, Michalska, Akitsuki, & Lahey, 2009) or psychopathic symptomatology as a whole (Marsh et al., 2013; Meffert, Gazzola, den Boer, Bartels, & Keysers, 2013). The first of these studies (Decety et al., 2009) reported enhanced activation in insula, ACC, and amygdala in adolescents (ages 16-18) exhibiting conduct disorder with aggressive features compared to healthy controls. By contrast, the latter study (Marsh et al., 2013) reported reduced activation in these structures for high-psychopathic adolescents (ages 10-17) versus control youth when exposed to injury scenarios under instructions to view the recipient as another person—but not under instructions to view the recipient as themselves. Correlational analyses focusing on participants in the psychopathic group showed that reduced activity in two of the three structures in question (ACC and amygdala) correlated with higher scores on the affective-interpersonal (but not the impulsive-antisocial) factor of the PCL. However, the psychopathic group comprised only 15 participants, calling into question the stability of these findings; in line with this concern, no corresponding associations were found for scores on the callous-unemotional factor of the APSD. The third study (Meffert et al., 2013) reported reduced activation of all three structures in adult forensic patients (ages 18–60 years) diagnosed as psychopathic using the PCL-R (total score  $\geq$  26), relative to nonpatient controls, when viewing vicarious depictions of physical harm ("pain") and also physical affection ("love"). The finding that reactivity in these (and other) brain regions was reduced in both conditions could conceivably reflect a link between empathic sensitivity and affiliative capacity (cf. Decety, 2011; see below). However, this study did not include nonaffective comparison condition; thus, it is not possible to know whether psychopathic patients were simply less reactive in general than controls.

In a study in which participants simply viewed injury scenes (i.e., without "point-of view" instructions), Lockwood and colleagues (2013) found that (1) contrary to the findings of Decety and colleagues (2009), young participants diagnosed with conduct disorder (ages 10–16; n = 36) as a whole (compared to control youth) showed reduced activation of anterior insula and ACC in response to depiction of others' pain; and (2) contrary to the findings of Marsh and colleagues (2013), callous-unemotional scores within the conduct disorder group did show a significant negative correlation with activation in these brain regions. Of note, Lockwood and colleagues (2013) reported opposing positive associations within this group between conduct problem symptoms and activation in these brain regions, and suggested (with reference to the previously noted study by Viding et al., 2012) that the difference in their findings from those of Decety and colleagues (2009) may reflect heterogeneity among youth diagnosed with conduct disorder.

Two other studies by Decety and colleagues (Decety, Chen, Harenski, & Kiehl, 2013; Decety, Skelly, & Kiehl, 2013) tested separate samples (cf. Decety, Skelly, & Kiehl, 2013) of adult incarcerated offenders identified as low, moderate, and high in psychopathy using the PCL-R (overall N = 124)—allowing for continuous-score analyses of psychopathy-brain response associations, as well as group analyses. In each of these studies, participants viewed images of hands and feet undergoing painful versus nonpainful contact. In one of the studies (Decety, Skelly, & Kiehl, 2013), participants simply viewed the images; in the other, participants viewed the images in alternating conditions in which they imagined either themselves or another person as the target of contact. In the simple-viewing version of the task, Decety, Skelly, and Kiehl (2013) reported enhanced reactivity for high versus low PCL-R scorers in two

of the three key pain network structures (anterior insula, ACC) and no difference for the third (amygdala). Largely similar results were reported by Decety, Chen, and colleagues (2013) for the "imagine-self" condition of the instructed-view task; for the "imagine-other" condition, however, high-psychopathy participants (relative to those low in psychopathy) showed reduced activation in the anterior insula and ACC, as well as other brain regions (though not the amygdala). However, continuous-score analyses of relations with insula and ACC activation in this task condition did not reveal preferential effects for one or the other PCL-R factor. For the amygdala, the authors reported a significant (p = .04) negative correlation for PCL-R Factor 1, with no mention of the r for Factor 2; while this implies a null correlation for the latter, a direct statistical comparison of effects for the two PCL-R factors (e.g., test of the difference in r's; hierarchical regression analysis testing for an incremental effect of Factor 1 over Factor 2) would be need to establish an actual difference. Additionally, these authors did not report the *r* between the two PCL-R factors in this study sample, leaving it unclear how much scores for the two overlapped.

Of note, participants in the Decety, Skelly, and Kiehl (2013) study were also tested in a separate task in which they viewed video clips of dynamic facial-pain expressions, interspersed with scrambled dynamic images as a contrast condition. Within this task, high PCL-R participants showed reduced ACC activation relative to low PCL-R participants, but enhanced activation of the anterior insula, and no difference in amygdala activation. Continuous-score analyses of data for this task did not reveal preferential relations for one or the other PCL-R factor with reduced medial ACC activation or enhanced anterior insula activation; for dorsal ACC, significantly enhanced activation was reported in relation to Factor 2 only, though, again, associations for the two factors were not directly compared.

In one other study, Seara-Cardaso, Viding, Lickley, and Sebastian (2015) examined relations between psychopathy and MRI brain response to depictions of pain in a male nonoffender (i.e., adult community; N = 46) sample. Participants were assessed for psychopathic tendencies using Paulhus and colleagues' (2015) self-report-based SRP; the MRI task procedure involved simple viewing of hands and feet undergoing painful versus nonpainful contact, as in Decety, Chen, and colleagues (2013). Correlational analyses were used to examine relations between continuous scores on the SRP as a whole, and its interpersonal-affective and impulsive-antisocial factors (which correspond to PCL-R Factors 1 and 2, respectively). No significant relations with brain reactivity to pain depictions were evident for SRP total or factor scores at the simple bivariate level. However, when scores for the two SRP factors were entered jointly into regression models predicting brain activation scores (thereby controlling for their shared variance), opposing relationships emerged for each with activation scores for pain-relevant regions. Specifically, variance unique to the SRP affective-interpersonal factor showed significant negative associations with activation in anterior insula and ACC (though not the amygdala), whereas variance unique to the SRP impulsive-antisocial factor showed significant positive associations with activation in these regions (though again not the amygdala). These findings, which demonstrate suppressor effects in relations for the two factors of SRP psychopathy with pain-network activation when viewing depictions of injury, converge with those of Lockwood and colleagues (2013) that show opposing associations for callous-unemotional symptoms and conduct problem symptoms (negative and positive, respectively) with activation in these same brain regions.

To summarize, findings from neuroimaging studies of brain reactivity to depictions of injury and expressed pain have been mixed (cf. Blair et al., Chapter 17, this volume), with a larger number of studies reporting evidence of reduced painnetwork activation in individuals exhibiting high levels of psychopathic tendencies (or, in two cases, conduct disorder symptoms), and a smaller set of studies reporting enhanced pain-network activation in such individuals. The instructional set under which participants view pain scenarios appears to make a difference: When scenarios are viewed under "imagine-other" instructions, decreased pain-network activation is observed; when scenes are viewed under "imagine-self" instructions, normal or increased pain-network activation is seen (Decety, Skelly, & Kiehl, 2013; Marsh et al., 2013). In the absence of instructions of either type (i.e., under simple viewing), findings tend to be mixed, with some studies reporting decreased activation (e.g., Lockwood et al., 2013) and others reporting enhanced activation (e.g., Decety, Chen, et al., 2013). The nature of diagnostic symptoms also seems to matter: Studies that have examined effects in terms of psychopathy subdimensions (factors) have found reductions in brain activation more in relation to affective–interpersonal symptoms than impulsive–antisocial symptoms—with two studies reporting increased activation for the latter (Lockwood et al., 2013; Seara-Cardoso et al., 2015). However, results for psychopathy factors have been more equivocal in offender studies that have used the PCL-R, and only one study to date has demonstrated reduced vicarious pain reactivity specifically in relation to the affective or callous–unemotional symptoms of psychopathy (Lockwood et al., 2013). Further studies using assessment measures that index psychopathy subdimensions more distinctively from one another will be needed to reach firmer conclusions regarding pain-processing deficits in psychopathy.<sup>6</sup>

# Social Attachment

In his influential review article on the nature and bases of empathy, Decety (2011) drew attention to empirical evidence for a connection between social attachment and capacity for empathic concern, including evidence pointing to shared neural circuitry for these two processes. In doing so, he highlighted the role of neurochemical systems in the regulation of attachment behavior, with a particular emphasis on the neuropeptide oxytocin, known to facilitate prosocial response tendencies including trust, cooperativeness, nurturance, and sensitivity to others' distress. Given the role of deficient social connectedness in historic accounts of psychopathy (e.g., Cleckley's [1941/1976] "general unresponsiveness in social relations"; McCord & McCord's [1964] "lovelessness") and its representation in contemporary assessment instruments for psychopathy (e.g., the Affective facet of the PCL-R; the Callous–Unemotional factor of the APSD; the Coldheartedness subscale of the PPI), it can be hypothesized that a subset of individuals exhibiting salient psychopathic tendencies possess a constitutionally based weakness in the capacity for social attachment, which relates in turn to a lack of empathic concern. This weakness in attachment capacity would be expected to relate more to the Factor 1 features of psychopathy-the affective or callous-unemotional ('mean') features, in particular—than to the Factor 2 features.

Surprisingly little research has evaluated this hypothesis; in particular, there is a paucity of human neuroscientific research addressing this possibility. A complicating factor in researching this topic is that dominant theories of attachment (e.g., Bowlby, 1969; Fraley, 2002; Mikulincer & Shaver, 2007) emphasize the role of early environmental influences (e.g., parent-child interactions; experience of abuse, neglect, or abandonment) in promoting normal versus maladaptive attachment. As such, these theories focus on dysfunctional attachment styles marked by insecurity, fear of rejection, and avoidance of closeness. The small number of studies to date that have examined relations between psychopathy and social attachment (for a review, see Conradi, Boertien, Cavus, & Verschuere, 2016) used inventories designed to assess attachment styles of these types, and found elevated levels of maladaptive attachment in relation to impulsive-antisocial features of psychopathy in particular-which are known to be associated with adverse life experiences (Blonigen, Sullivan, Hicks, & Patrick, 2012; Poythress et al., 2010; see also Porter, 1996) and heightened negative affectivity (e.g., Benning, Patrick, Blonigen, et al., 2005; Verona, Patrick, & Joiner, 2001).

As an example, one recent study by Craig, Gray, and Snowden (2013) examined relations between facets of psychopathy assessed using the TriPM and questionnaire measures of (1) attachmentrelated anxiety and avoidance experienced in current social relationships, and (2) remembered levels of parental care and overprotection experienced up through midadolescence. Study participants were 214 adults (mostly undergraduates) who completed questionnaire inventories online. Major findings were that (1) scores on TriPM Disinhibition correlated positively with both attachment anxiety and attachment avoidance, and negatively and positively (respectively) with recollections of parental care and overprotection; (2) TriPM Meanness showed a weaker positive rwith attachment avoidance, a negligible correlation with attachment anxiety, and similarly weak correlations with parental care and overprotection (negative and positive, respectively); and (3) TriPM Boldness showed negative r's with the two attachment variables, and positive and null r's (respectively) with recollections of parental care and overprotection. Thus, the strongest relations for indices of dysfunctional attachment were with the impulsive-disinhibitory facet of psychopathy; associations with the callous-unemotional facet were weaker-and perhaps accounted for by overlap with the disinhibition facet, though this possibility was not evaluated statistically. By contrast, the boldness facet of psychopathy was associated with low levels of dysfunctional attachment (i.e., more adaptive attachment).

From the foregoing, it can be inferred that standard attachment-style inventories are not

well suited to indexing the weak social connectedness that characterizes classically "detached" psychopathic individuals, as distinguished from affectively dysregulated externalizing individuals (Hicks & Drislane, Chapter 13, this volume). The triarchic model characterizes the social deficit in psychopathy as active ("agentic") disaffiliationinvolving pursuit of goals/resources without concern for the feelings or welfare of others (Patrick et al., 2009). The triarchic model views this active disaffiliative orientation, which contrasts with the passive disaffiliation seen in conditions such as autism and schizoid personality disorder, as central to the callous-unemotional (meanness) facet of psychopathy; it is seen to involve some element of fearlessness, along with a lack of affectional capacity, as evidenced by research demonstrating fearless behavioral tendencies (Frick & Marsee, Chapter 19, this volume; Frick et al., 2014) and reduced physiological defensive reactivity to aversive cues (Goulter, Kimonis, Fanti, & Hall, 2015; Kyranides, Fanti, Sikki, & Patrick, 2017) in high-callous adolescents and young adults. One etiological basis for this orientation may be an inborn predatory disposition that exists at some rate in the general population because it confers a survival advantages in harsh competitive environments (Buss, 2005). Some individuals who develop into serial murderers (Hickey, Walters, Drislane, Palumbo, & Patrick, Chapter 23, this volume) may possess this disposition (see, e.g., Douglas & Dodd, 2007). It is presumed that this behavioral orientation can also arise in an acquired manner, through repeated adversarial interactions that foster a hostile, antagonistic stance toward others (Lynam, 1996; Patterson, Reid, & Dishion, 1992).

New research strategies and measurement methods will be needed to evaluate the hypothesis of a core active-dissaffiliative component to the callous-unemotional (meanness) facet of psychopathy, and to clarify its intersections with deficient empathic concern and fearlessness. One fruitful avenue would be to apply paradigms used in social neuroscience research to investigate abnormalities in social affiliation/engagement in high-callous individuals. As an example of this, Vieira and Marsh (2014) examined responses of individuals assessed for psychopathic tendencies using the PPI-R in an interpersonal distance task, in which participants indicated desired "stopping points" on trials involving either physical approach on their part toward the experimenter, or on the part of the experimenter toward them. The major finding of the study was a negative correlation between scores on the Coldheartedness facet of the PPI-R (akin to meanness; Drislane et al., 2014) and interpersonal distance, reflecting selection of shorter interpersonal stopping distances as a function of higher Coldheartedness scores; this association was specific to Coldheartedness (i.e., corresponding r's for the FD and SCI facets of the PPI-R were nonsignificant). The authors discussed this finding in relation to the well-known proclivity toward proactive aggression in high-callous individuals (see Frick & Marsee, Chapter 19, and Porter, Woodworth, & Black, Chapter 25, this volume) and research showing reduced interpersonal stopping distance in a patient with bilateral amygdala damage (Kennedy, Glascher, Tyszka, & Adolphs, 2009)-suggesting that preference or tolerance for closer social proximity in participants with high PPI-R Coldheartedness scores reflects a reduced intimidative stance toward others, related in part to amygdala dysfunction. This interpretation fits well with the idea of callous unemotionality (meanness) as involving a predatory social orientation rooted partly in weak affiliation and partly in fearlessness (Patrick et al., 2009).

# Synopsis and Perspective

The construct of callous unemotionality has been studied as a distinct facet of psychopathy to an extensive degree over the past two decades by investigators interested in the origins and course of early emerging conduct problems. The literature on this symptom facet in youth, together with historic and contemporary writings on criminal psychopathy in adults and work identifying the broad trait of antagonism (vs. agreeableness) as a major correlate of psychopathy (Lynam, Miller, & Derefinko, Chapter 11, this volume), served as points of reference for the construct of "meanness" in the triarchic model. Neuroscientific research on callous unemotionality has provided evidence that this symptom subdimension involves deficient sensitivity to the distress of others, related in particular to amygdala dysfunction, and perhaps also to underreactivity of brain structures implicated in vicarious pain experience (anterior insula, ACC). Other biobehavioral attributes that have been posited to play a role in this facet of psychopathy are fearlessness and weak capacity for social attachment or connectedness.

The evidence for involvement of differing (albeit functionally interrelated) neural systems in empathic sensitivity versus callousness suggests that the etiology of this dispositional dimension, like that of inhibitory control and defensive reactivity, is complex. Consistent with this, a genomewide association study by Viding and colleagues (2010) revealed no significant effects for any individual SNPs in discriminating groups of schoolchildren scoring high versus low on both callous-unemotional tendencies and conduct problems assessed via teacher ratings. A follow-up study by Viding and colleagues (2013) that examined teacher-rated callous unemotionality per se as a continuous score variable across 2,930 child-age twins also found no significant effects for individual SNPs; moreover, a genomewide complex trait analysis (which quantifies heritability based on aggregate additive effects for common SNPs across the entire genome) vielded a near-zero estimate of heritability, in contrast with an appreciable twin-based heritability estimate. The authors interpreted these findings as indicating (1) that common gene variants contribute in a configural rather than additive manner to callous-unemotional tendencies, and/or (2) that rare gene variants not represented in standard genomic analysis arrays contribute importantly to the heritability of callous-unemotional tendencies.

# **Summary and Integration**

Harkening back to points made at the outset, efforts to identify cognitive and affective processes that underlie psychopathic symptomatology and establish their causal origins must contend with certain key aspects of this clinical construct that are now well established. One is that psychopathy is a continuous dimensional phenomenon rather than a discretely occurring syndrome. Another is that psychopathy is multifaceted rather than unitary. Related to this, different variants ("subtypes") of psychopathy have been identified through empirical research to date, and other variants may be identified in the future as ideas about what psychopathy encompasses evolve.7 It is also important to consider the role of development in the emergence and progression of psychopathic symptomatology and affiliated neuropsychological processes across time and life circumstances.

Given these complexities and the state of existing research evidence, what can we say about the nature of cognitive and affective processing deviations associated with psychopathic symptomatology and their bases in brain systems? An extensive body of research over the past several years, described earlier under the heading "Inhibitory Control and Externalizing Proneness (Disinhibition)," has established the existence of a highly heritable liability for problems involving weak behavioral restraint and deficient affective control. The phenotypic expression of this liability is dimensional rather than discrete-that is, individuals vary continuously in disinhibitory traits and proneness to problems associated with such traits (e.g., rule breaking, risk taking, angry aggression, substance abuse). The positions of individuals along this dispositional continuum are determined by many genes operating in concert rather than by a small number of genes exerting strong individual influence (McGue et al., 2013). Two known indicators of this externalizing proneness (trait disinhibition) dimension, as established by twin studies directly testing for genetic mediation of their phenotypic relations with externalizing liability, are behavioral performance on inhibitory control tasks and P3 brain response. The degree of relationship of each with externalizing proneness as assessed psychologically (i.e., by clinical interview or self-report) is modest-that is, there are many other sources besides externalizing proneness that contribute to the systematic variance in these indicators. However, the variance in each indicator that overlaps with externalizing proneness largely reflects common genetic influence. The implication is that externalizing proneness reflects genetically based variations in neural processing that are indexed to some degree by inhibitory task performance and P3 brain response.

What is the nature of neural processing deviations that correspond to disinhibitory liability? The behavioral manifestations of this liability in adolescence and adulthood, and its documented relations with performance at these age periods on inhibitory control tasks and other tests of executive function, point to impairments in frontal brain systems that operate to regulate behavioral and affective responding on the basis of internal representations of goals and potential consequences. However, developmental theorists (e.g., Beauchaine & McNulty, 2013; Nigg & Casey, 2005) postulate that the emergence of a normally functioning frontal executive system depends on a delicate interplay among primal perceptual, motivational, and learning systems beginning very early in life. In line with evidence that disinhibitory liability is highly polygenic, it is theorized that disruptions of various types in these primal systems can compromise the normal development of the frontal control system. From this perspective, impairments in executive function seen in adolescents and adults who exhibit disinhibitory traits and problems are the *consequence* of genetically based neural processing deviations of differing types (cf. Nigg & Casey, 2005) that operate in concert with environmental influences across time to moderate neurocognitive development. This way of thinking about the executive system dysfunction exhibited by high-disinhibited individuals acknowledges the developmental science principle of multifinality (Cicchetti & Rogosch, 1996).

Psychologically and behaviorally, the frontal system dysfunction associated with externalizing proneness in adolescence and adulthood (and perhaps much earlier in life; see, e.g., Morgan & Lilienfeld, 2000; Orban, Rapport, Friedman, & Kofler, 2014) manifests as a general tendency to act in response to immediate cues and contingencies rather than on the basis of internal representations of goals and plans. Reduced P3 brain response, which covaries with control task indicators of externalizing proneness (Venables et al., in press), appears to index this immediate cue-driven orientation (Bernat et al., 2011; Patrick & Bernat, 2009; see also Foell et al., 2016). In turn, this processing orientation weakens the ability to anticipate obstacles or problems and down-regulate emotional reactions that can lead to adverse consequences. Individuals exhibiting dysfunction of this type are thus prone to rash decisions, urge-driven acts, angry aggressive behavior, and repetition of past mistakes (Davidson et al., 2000).

Available evidence indicates that some individuals who meet PCL-R diagnostic criteria for psychopathy are of this type. It is likely that most of these frontally-impaired, externalizing-prone individuals fall into the subgroup of high PCL-R scorers who have been characterized as "secondary" (Skeem, Johansson, Andershed, Kerr, & Eno Louden, 2007) or "aggressive" (Hicks, Markon, Patrick, Krueger, & Newman, 2004) psychopaths. The major defining characteristics of this subgroup are high negative affectivity (including elevated anxiousness or stress reactivity, along with hostile mistrust and aggressiveness) and high impulsiveness; on average, individuals in this subgroup show increased susceptibility to alcohol dependence (Hicks et al., 2004) along with higher rates of major mental illness; elevated levels of avoidant, dependent, and borderline symptomatology; and poorer psychosocial functioning (Skeem et al., 2007). To meet PCL-R criteria for psychopathy, offenders of this type must exhibit at least a moderate level of affective-interpersonal features together with high levels of impulsive–antisocial features. The developmental psychopathology literature suggests a basis for this, in terms of the impact of repeated adversarial social interactions/ experiences that promote a hostile–antagonistic orientation toward others.

However, as noted earlier, many high-scoring PCL-R offenders do not show clear evidence of impairment on tests of frontal executive function, at least compared to low-scoring PCL-R offenders. (A notable limitation of research in this area is that offender subgroups are typically compared with one another but not with matched nonoffender controls.) Similarly, writings on psychopathy in clinic-referred youth (Frick & Marsee, Chapter 19, this volume; Frick et al., 2014) have noted that frontal executive impairment tends to be characteristic of individuals with conduct problems who are lacking in callous-unemotional traits rather than those showing high levels of such traits. Nonetheless, by definition, adults who score high on the PCL-R as a whole, and youth with conduct problems who score high in callous-unemotional traits, exhibit salient externalizing behavior (i.e., rule breaking, risk taking, impulsiveness, irresponsibility, aggression). The implication, in line with the developmental concept of equifinality, is that externalizing behavior may arise for reasons other than executive system dysfunction associated with high disinhibitory liability per se (i.e., there are alternative etiological "pathways" to impulsive-antisocial behavior; see Fowles, Chapter 5, and Frick & Marsee, Chapter 19, this volume).

What characteristics aside from (or in combination with) disinhibitory liability contribute to psychopathic symptomatology? The weight of available evidence indicates that emotional dysfunction—in forms including deficient defensive (fear) reactivity, reduced sensitivity to cues of distress or pain in others, and perhaps reduced affiliative capacity (though this possibility remains understudied)-plays a distinctive role in the affective-interpersonal (Factor 1) features of psychopathy. There are reasons to believe that emotional dysfunction in these forms, like disinhibitory liability, varies in a continuous dimensional manner across individuals rather than occurring discretely (i.e., present in some individuals vs. absent in others). One basis for this viewpoint is evidence from experimental studies, as described earlier, demonstrating continuous score associations between psychopathic symptomatology and physiological measures indicative of emotional dysfunction (e.g., Benning, Patrick, Hicks, Blonigen, & Krueger, 2003; Brislin et al., 2017; Kyranides et al., 2017; Lockwood et al., 2013; Vaidyanathan et al., 2011). Another is evidence from genomewide association studies indicating that dispositions of fearfulness and callous unemotionality, which twin studies have shown to be appreciably heritable, are (like externalizing proneness) highly polygenic. From this perspective, it may be preferable to conceive of measurable deviations in fear reactivity and empathic sensitivity as *indicators* of psychopathy-related dispositions that arise from the complex interplay of diverse causal influences across time, rather than as "mechanisms" for psychopathic symptomatology.

Regarding the role of these affective dispositions in psychopathy, the triarchic model characterizes clinical cases of this condition as involving externalizing behavior accompanied by either dispositional fearlessness (boldness) or callous unemotionality (meanness)—or some combination of these two dispositions. Along with individuals who exhibit affective detachment secondarily to high disinhibitory liability (e.g., as a function of repeated adversarial interactions), the model posits that persons who meet clinical diagnostic criteria for psychopathy include (1) individuals who possess disinhibitory liability in conjunction with core affective detachment (i.e., liability for boldness and/or meanness), and (2) individuals who exhibit externalizing behavior secondary to core affective detachment. These three subsets of psychopathic individuals might be designated "primarily disinhibited," "combined liability," and "primarily detached." The empirical evidence for disinhibition, boldness, and meanness as continuously varying, polygenic dispositions lends credibility to the idea that liabilities for the three can occur in varying combinations.

The presence of core affective deficits in conjunction with externalizing liability may operate both to exacerbate disinhibitory tendencies and, as I discussed in my opening chapter for this volume, moderate their expression. An exacerbating influence of affective deficits on externalizing behavior associated with disinhibitory liability is expected from the viewpoint of decision making and action being guided by internal representations (Miller & Cohen, 2001). To the extent that individuals are deficient in control system function and lacking as well in fear of aversive outcomes, sensitivity to others' distress, or feelings of closeness/connectedness, their propensity to act in the moment without regard for consequences will be high. When affective deficits are present, only moderate levels of disinhibitory liability may be required to produce a reckless, unrestrained behavioral orientation. This may help to account for why many psychopathic individuals do not show impaired performance on behavioral tests of frontal executive function.

The possibility that some clinically psychopathic individuals are mainly lacking in affective capacity, without appreciable levels of disinhibitory liability, would help to further account for findings of normal executive task performance in many such individuals. From a control system perspective, "primarily detached" individuals would have an intact capacity to guide behavior on the basis of internal representations of goals and strategies for attaining them, but their representational schemas would be deficient in motivational elements pertaining to danger/risk (in the case of boldness) or concern/caring for others (in the case of meanness). However, it remains unclear at this time whether low fear (boldness) in itself disposes toward maladaptive psychopathic behavior (e.g., reckless destructive acts; selfish victimization of others); indeed, there is evidence that high boldness is associated as much or more with prosocial forms of behavior, including leadership and heroism (see Lilienfeld et al., Chapter 8, this volume). It may be that low fear needs to be accompanied by some degree of disinhibitory liability or callousness to be expressed in maladaptive antisocial ways. It also remains unclear to what extent callous unemotionality (meanness) in itself, when not accompanied by disinhibitory liability or low fear, would give rise to the full symptom picture of psychopathy. As discussed by Hickey and colleagues (Chapter 23, this volume), serial murderers exemplify the meanness facet of psychopathy, but in many cases lead highly compartmentalized "double lives" quite uncharacteristic of clinically psychopathic individuals.

In closing, it should be clear from this integrative review that advances in conceptualizing psychopathy, including recognition of its dimensional and multifaceted nature, have established the foundation for a richer process-based understanding of this clinical condition. Increasingly, research on cognitive and affective processing deviations associated with psychopathy has progressed toward examining effects in relation to symptom subdimensions (facets) and diagnostic variants (subtypes). The triarchic model, which was formulated with these conceptual advances in mind and characterizes psychopathy in terms of core biobehavioral dispositions, can serve as a referent for integrating findings from process-oriented studies that use different measures of psychopathy to index subdimensions or delineate subgroups. As our knowledge of brain and behavioral correlates of distinct psychopathy facets increases, it will become possible to evaluate their interrelations and form composites of converging indicators from these domains that can complement report-based assessments. For example, disinhibitory tendencies could be quantified using variants of P3 and cognitive performance indicators along with traitscale measures (Patrick et al., 2013; Venables et al., 2017), whereas callous unemotionality could be operationalized using brain and behavioral indicators of fear-face processing combined with scale measures (Brislin et al., 2017). This multidomain approach to quantifying psychopathic tendencies (cf. Patrick & Drislane, 2015) is likely to be advantageous for identifying relevant brain circuits in neuroimaging studies, for tracing the emergence of cognitive-affective processing deviations across time in neurodevelopmental studies, and for designing effective interventions to prevent or remediate these processing deviations.

#### ACKNOWLEDGMENTS

Preparation of this chapter was supported by Grant No. W911NF-14-1-0018 from the U.S. Army. The content of this chapter is solely the responsibility of the author and does not necessarily represent the official views of the U.S. Government, Department of Defense, Department of the Army, Department of Veterans Affairs, or U.S. Recruiting Command.

#### NOTES

- 1. The term "mechanisms" appears in quotes because evidence reviewed in this chapter (and in other chapters of this volume) indicates that the observable symptoms of psychopathy reflect the interplay of differing polygenic liabilities with environment influences of various types across time and stages of development (Fowles, Chapter 5, this volume). In light of this, measurable deviations in cognitive and affective processing are perhaps best viewed as *indicators* of symptom-related attributes that arise from the complex interplay of diverse causal influences across time rather than as mechanisms for psychopathic symptomatology.
- 2. This study used a shortened (56-item) version of the PPI that included only a portion of items from the subscales comprising FD—with particularly weak representation of Stress Immunity and Fearlessness items known to be most indicative of boldness (Hall et al., 2014). Of note, these authors reported

significantly reduced aversive startle potentiation for participants as a whole (females as well as males) who scored low on traits of Anxiousness and Harm Avoidance, which correspond to Stress Immunity and Fearlessness in reverse. The implication is that stronger effects for PPI-FD would have been found if the full-form version of the PPI had been used.

- 3. Three studies (Bradley, Moulder, & Lang, 2005; Kaye, Bradford, & Curtin, 2016; Lissek et al., 2007) have collected startle data from picture viewing and shock-cueing tasks for the same participants, but none of these studies report correlations across subjects between startle potentiation during aversive picture viewing and potentiation during shock cueing.
- 4. Whereas Marsh and Blair (2008) concluded in their meta-analytic review that affect recognition deficits for antisocial psychopathic individuals were strongest for fearful faces and next-strongest for sad faces, in a more recent meta-analysis covering a larger number of studies, Dawel, O'Kearney, McKone, and Palermo (2012) concluded that affect recognition deficits in individuals high in overall psychopathy were nonspecific—occurring for happy and surprised faces as well as fearful and sad faces. However, these authors suggested that recognition deficits for the affective—interpersonal factor of psychopathy may be more specific to fearful faces, though they cautioned that further studies examining effects separately for the two factors are needed.
- 5. Within this same article, Brislin and colleagues (2017) also reported replicating the finding of impaired recognition of affective (in particular, fearful) faces in relation to callousness (as indexed by TriPM Meanness scale scores) in a separate young adult sample (mean age = 20 years).
- 6. Two recent studies (Brislin, Buchman-Schmitt, Joiner, & Patrick, 2016; Miller, Rausher, Hyatt, Maples, & Zeichner, 2014) that used nonoffender samples and questionnaire measures of psychopathy reported evidence of higher physical pain tolerance (i.e., acceptance of more intense levels of painful stimulation) in participants scoring higher in psychopathy. One of these studies (Miller et al., 2014) used the SRP and found effects most consistently (i.e., across both pressure and shock forms of stimulation) for its Callous Affect facet; the other study (Brislin et al., 2016) used the TriPM and found a selective association for its Meanness scale with tolerance for pressure pain. These findings raise the interesting question of whether psychopathic individuals might show reduced sensitivity to pain in others because they are less sensitive to pain stimulation themselves. However, these findings are difficult to reconcile with reports of enhanced reactivity when viewing pain-exposure scenes under instructions to imagine oneself as the recipient (Decety, Chen, et al., 2013; Marsh et al., 2013). Research in which reactivity is assessed during personal pain exposure, as
well as during viewing of pain-exposure scenes under "imagine-self" and "imagine-other" instructions, will be needed to clarify this.

7. As discussed by Hicks and Drislane (Chapter 13, this volume), the term "variants" may be preferable to the term "subtypes," which implies discrete separation among subgroups of psychopathic individuals. From the perspective of psychopathic traits as dimensional in nature, psychopathy variants can be viewed as subsets of diagnosable individuals occupying distinct positions in the multidimensional space defined by scores on an array of cluster variates.

#### REFERENCES

- Andershed, H., Kerr, M., Stattin, H., & Levander, S. (2002). Psychopathic traits in non-referred youths: A new assessment tool. In E. Blaauw & L. Sheridan (Eds.), Psychopaths: Current international perspectives (pp. 131–158). The Hague: Elsevier.
- Anderson, N. E., Stanford, M. S., Wan, L., & Young, K. A. (2011). High psychopathic trait female exhibit reduced startle potentiation and increased P3 amplitude. *Behavioral Sciences and the Law*, 29, 649–666.
- Baas, J. M., Grillon, C., Böcker, K. B., Brack, A. A., Morgan, C. A., Kenemans J. L., et al. (2002). Benzodiazepines have no effect on fear-potentiated startle in humans. *Psychopharmacology*, 161, 233–247.
- Barrett, L. F. (2017). The theory of constructed emotion: An active inference account of interoception and categorization. Social Cognitive and Affective Neuroscience, 12, 1–23.
- Baskin-Sommers, A. R., Curtin, J. J., & Newman, J. P. (2011). Specifying the attentional selection that moderates the fearlessness of psychopathic offenders. *Psychological Science*, 22, 226–234.
- Baskin-Sommers, A. R., Newman, J. P., Sathasivam, N., & Curtin, J. J. (2010). Evaluating the generalizability of a fear deficit in psychopathic African American offenders. *Journal of Abnormal Psychology*, 120, 71–78.
- Beauchaine, T. P., & McNulty, T. (2013). Comorbidities and continuities as ontogenic processes: Toward a developmental spectrum model of externalizing psychopathology. *Development and Psychopathology*, 25, 1505–1528.
- Bechara, A., Damasio, H., Tranel, D., & Damasio, A. R. (1997). Deciding advantageously before knowing the advantageous strategy. *Science*, 275, 1293–1295.
- Benning, S. D., Patrick, C. J., Blonigen, D. M., Hicks, B. M., & Iacono, W. G. (2005). Estimating facets of psychopathy from normal personality traits: A step toward community-epidemiological investigations. Assessment, 12, 3–18.
- Benning, S. D., Patrick, C. J., Hicks, B. M., Blonigen, D. M., & Krueger, R. F. (2003). Factor structure of the Psychopathic Personality Inventory: Validity and implications for clinical assessment. *Psychological As*sessment, 15, 340–350.

- Benning, S. D., Patrick, C. J., & Iacono, W. G. (2005). Fearlessness and underarousal in psychopathy: Startle blink modulation and electrodermal reactivity in a young adult male community sample. *Psychophysiol*ogy, 42, 753–762.
- Bernat, E. M., Nelson, L. D., Steele, V. R., Gehring, W. J., & Patrick, C. J. (2011). Externalizing psychopathology and gain/loss feedback in a simulated gambling task: Dissociable components of brain response revealed by time-frequency analysis. *Journal of Abnormal Psychology*, 120, 352–364.
- Berridge, K. C., & Robinson, T. E. (1998). What is the role of dopamine in reward: Hedonic impact, reward learning, or incentive salience? *Brain Research Re*views, 28, 309–369.
- Birbaumer, N., Veit, R., Lotze, M., Erb, M., Hermann, C., Grodd, W., et al. (2005). Deficient fear conditioning in psychopathy: A functional magnetic resonance imaging study. Archives of General Psychiatry, 62, 799–805.
- Blair, R. J. R. (1995). A cognitive-developmental approach to morality: Investigating the psychopath. Cognition, 57, 1–29.
- Blair, R. J. R. (1999). Responsiveness to distress cues in the child with psychopathic tendencies. *Personality* and Individual Differences, 27, 135–145.
- Blair, R. J. R. (2007). The amygdala and ventromedial prefrontal cortex in morality and psychopathy. *Trends in Cognitive Sciences*, 11, 387–392.
- Blair, R. J. R., Budhani, S., Colledge, E., & Scott, S. (2005). Deafness to fear in boys with psychopathic tendencies. *Journal of Child Psychology and Psychiatry*, 46(3), 327–336.
- Blair, R. J. R., & Cipolotti, L. (2000). Impaired social response reversal: A case of "acquired sociopathy." *Brain*, 123, 1122–1141.
- Blair, R. J. R., & Coles, M. (2000). Expression recognition and behavioural problems in early adolescence. *Cognitive Development*, 15, 421–434.
- Blair, R. J. R., Colledge, E., Murray, L., & Mitchell, D. G. (2001). A selective impairment in the processing of sad and fearful expressions in children with psychopathic tendencies. *Journal of Abnormal Child Psychology*, 29(6), 491–498.
- Blair, R. J. R., Jones, L., Clark, F., & Smith, M. (1997). The psychopathic individual: A lack of responsiveness to distress cues? *Psychophysiology*, 34, 192–198.
- Blair, R. J., Mitchell, D. G., Richell, R. A., Kelly, S., Leonard, A., Newman, C., et al. (2002). Turning a deaf ear to fear: Impaired recognition of vocal affect in psychopathic individuals. *Journal of Abnormal Psychology*, 111(4), 682–686.
- Blonigen, D. M., Hicks, B. M., Patrick, C. J., Krueger, R. F., Iacono, W. G., & McGue, M. K. (2005). Psychopathic personality traits: Heritability and genetic overlap with internalizing and externalizing psychopathology. *Psychological Medicine*, 35, 1–12.
- Blonigen, D. M., Patrick, C. J., Douglas, K. S., Poythress, N. G., Skeem, J. L., Lilienfeld, S. O., et al. (2010).

Multimethod assessment of psychopathy in relation to factors of internalizing and externalizing from the Personality Assessment Inventory: The impact of method variance and suppressor effects. *Psychological Assessment*, 22, 96–107.

- Blonigen, D. M., Sullivan, E. S., Hicks, B. M., & Patrick, C. J. (2012). Facets of psychopathy in relation to potentially traumatic events and posttraumatic stress disorder among female prisoners: The mediating role of borderline personality disorder traits. *Personality Disorders: Theory, Research, and Treatment,* 3, 406–416.
- Blum, K., Chen, A. L., Braverman, E. R., Comings, D. E., Chen, T. J. H., Arcuri, V., et al. (2008). Attentiondeficit-hyperactivity disorder and reward deficiency syndrome. *Neuropsychiatric Disease and Treatment*, 4, 893–918.
- Blumer, D., & Benson, D. F. (1975). Personality changes with frontal and temporal lobe lesions. In D. F. Benson & D. Blumer (Eds.), *Psychiatric aspects of neurological disease* (pp. 151–169). New York: Grune & Stratton.
- Bowlby, J. (1969). Attachment and loss: Vol. 1. Attachment. New York: Basic Books.
- Bradley, M. M. (2009). Natural selective attention: Orienting and emotion. Psychophysiology, 46, 1–11.
- Bradley, M. M., Moulder, B., & Lang, P. J. (2005). When good things go bad: The reflex physiology of defense. *Psychological Science*, 16, 468–473.
- Brislin, S. J., Buchman-Schmitt, J. M., Joiner, T. E., & Patrick, C. J. (2016). "Do unto others?": Distinct psychopathy facets predict reduced perception and tolerance of pain. Personality Disorders: Theory, Research, and Treatment, 7, 240–246.
- Bradley, M. M., Zlatar, Z. Z., & Lang, P. J. (2018). Startle reflex modulation during threat of shock and "threat" of reward. *Psychophysiology*, 55, e12989.
- Brislin, S. J., Yancey, J. R., Perkins, E. R., Palumbo, I. M., Drislane, L. E., Salekin, R. T., et al. (2017). Callousness and affective face processing in adults: Behavioral and brain-potential indicators. *Personality Disorders: Theory, Research, and Treatment.* [Epub ahead of print]
- Broadbent, N. J., Squire, L. R., & Clark, R. E. (2004). Spatial memory, recognition memory, and the hippocampus. Proceedings of the National Academy of Sciences of the USA, 101, 14515–14520.
- Broerse, A., Crawford, T. J., & den Boer, J. A. (2001). Parsing cognition in schizophrenia using saccadic eye movements: A selective overview. *Neuropsychologia*, 39, 742–756.
- Buss, D. M. (2005). The murderer next door: Why the mind is designed to kill. New York: Penguin Press.
- Carlson, S. R., Thái, S., & McLaron, M. E. (2009). Visual P3 amplitude and self-reported psychopathic personality traits: Frontal reduction is associated with self-centered impulsivity. *Psychophysiology*, 46, 100–113.
- Carter, C. S., Braver, T. S., Barch, D. M., Botvinick, M.

M., Noll, D. N., & Cohen, J. D. (1998). Anterior cingulate cortex, error detection, and the online monitoring of performance. *Science*, 280, 747–749.

- Cicchetti, D., & Rogosch, F. A. (1996). Equifinality and multifinality in developmental psychopathology. *De*velopment and Psychopathology, 8, 597–600.
- Cleckley, H. (1976). *The mask of sanity* (5th ed.). St. Louis, MO: Mosby. (Original work published 1941)
- Cloninger, C. R. (1987). A systematic method for clinical description and classification of personality variants: A proposal. Archives of General Psychiatry, 44, 573–588.
- Cohen, J. D., & O'Reilly, R. C. (1996). A preliminary theory of the interactions between prefrontal cortex and hippocampus that contribute to planning and prospective memory. In M. Brandimonte, G. O. Einstein, & M. McDaniel (Eds.), Prospective memory: Theory and applications (pp. 267–296). Mahwah, NJ: Erlbaum.
- Cohen, J. D., & Servan-Schreiber, D. (1992). Context, cortex, and dopamine: A connectionist approach to behavior and biology in schizophrenia. *Psychological Review*, 99, 45–77.
- Conradi, H. J., Boertien, S. D., Cavus, H., & Verschuere, B. (2016). Examining psychopathy from an attachment perspective: The role of fear of rejection and abandonment. *Journal of Forensic Psychiatry and Psychology*, 27, 92–109.
- Cornwell, B. R., Alvarez, R. P., Lissek, S., Kaplan, R., Ernst, M., & Grillon, C. (2011). Anxiety overrides the blocking effects of high perceptual load on amygdala reactivity to threat-related distractors. *Neuropsychologia*, 49, 1363–1368.
- Costa, P. T., Jr., & McCrae, R. R. (1992). Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI): Professional manual. Odessa, FL: Psychological Assessment Resources.
- Craig, R. L., Gray, R., & Snowden, R. (2013). Recalled parental bonding, current attachment, and the triarchic conceptualisation of psychopathy. *Personality* and Individual Differences, 55, 345–350.
- Curtin, J. J., Lang, A. R., Patrick, C. J., & Stritzke, W. G. K. (1998). Alcohol and fear-potentiated startle: The role of distraction in the stress-reducing effects of intoxication. *Journal of Abnormal Psychology*, 107, 545–555.
- Curtin, J. J., Patrick, C. J., Lang, A. R., Cacioppo, J. T., & Birbaumer, N. (2001). Alcohol affects emotion through cognition. *Psychological Science*, 12, 527–531.
- Dadds, M. R., El Masry, Y., Wimalaweera, S., & Guastella, A. J. (2008). Reduced eye gaze explains "fear blindness" in childhood psychopathic traits. *Journal* of the American Academy of Child and Adolescent Psychiatry, 47, 455–463.
- Damasio, A. R., Tranel, D., & Damasio, H. (1990). Individuals with sociopathic behavior caused by frontal damage fail to respond autonomically to social stimuli. Behavioral Brain Research, 41, 81–94.
- Damasio, H., Grabowski, T., Frank, R., Galaburda, A.

M., & Damasio, A. R. (1994). The return of Phineas Gage: Clues about the brain from the skull of a famous patient. *Science*, 264, 1102–1105.

- Davidson, R. J., Putnam, K. M., & Larson, C. L. (2000). Dysfunction in the neural circuitry of emotion regulation—A possible prelude to violence, *Science*, 289, 591–594.
- Davis, M. (1989). Neural systems involved in fear-potentiated startle. Annals of the New York Academy of Sciences, 563, 165–183.
- Davis, M., & Lee, Y. (1998). Fear and anxiety: Possible roles of the amygdala and bed nucleus of the stria terminalis. Cognition and Emotion, 12, 277–305.
- Dawel, A., O'Kearney, R., McKone, E., & Palermo, R. (2012). Not just fear and sadness: Meta-analytic evidence of pervasive emotion recognition deficits for facial and vocal expressions in psychopathy. *Neuroscience and Biobehavioral Reviews*, 36, 2288–2304.
- Decety, J. (2011). The neuroevolution of empathy. Annals of the New York Academy of Sciences, 1231, 35–45.
- Decety, J., Chen, C., Harenski, C., & Kiehl, K. A. (2013). An fMRI study of affective perspective taking in individuals with psychopathy: Imagining another in pain does not evoke empathy. *Frontiers of Human Neuroscience*, 7, Article 489.
- Decety, J., Michalska, K. J., Akitsuki, Y., & Lahey, B. B. (2009). Atypical empathic response in adolescents with aggressive conduct disorder: A functional MRI investigation. *Biological Psychology*, 80, 203–211.
- Decety, J., Skelly, L. R., & Kiehl, K. A. (2013). Brain response to empathy-eliciting scenarios involving pain in incarcerated individuals with psychopathy. JAMA Psychiatry, 70, 638–645.
- Dias, R., Robbins, T. W., & Roberts, A. C. (1996). Dissociation in prefrontal cortex of affective and attentional shifts. *Nature*, 380, 69–72.
- Dindo, L., & Fowles, D. C. (2011). Dual temperamental risk factors for psychopathic personality: Evidence from self-report and skin conductance. *Journal of Per*sonality and Social Psychology, 100, 557–566.
- Donohue, K. F., Curtin, J. J., Patrick, C. J., & Lang, A. R. (2007). Intoxication level and emotional response. *Emotion*, *7*, 103–112.
- Douglas, J., & Dodd, J. (2007). Inside the mind of BTK: The true story behind the thirty-year hunt for the notorious Wichita serial killer. San Francisco: Jossey-Bass.
- Drislane, L. E., Patrick, C. J., & Arsal, G. (2014). Clarifying the content coverage of differing psychopathy inventories through reference to the Triarchic Psychopathy Measure. *Psychological Assessment*, 26, 350–362.
- Dunlop, B. W., & Nemeroff, C. B. (2007). The role of dopamine in the pathophysiology of depression. Archives of General Psychiatry, 64, 327–337.
- Dvorak-Bertsch, J. D., Curtin, J., Rubinstein, T., & Newman, J. P. (2009). Psychopathic traits moderate the interaction between cognitive and affective processing. Psychophysiology, 46, 913–921.
- Fanselow, M. S. (1994). Neural organization of the de-

fensive behavior system responsible for fear. *Psycho*nomic Bulletin and Review, 1, 429–438.

- Flor, H., Birbaumer, N., Hermann, C., Ziegler, S., & Patrick, C. J. (2002). Aversive Pavlovian conditioning in psychopaths: Peripheral and central correlates. *Psychophysiology*, 39, 505–518.
- Foell, J., Brislin, S. J., Strickland, C. M., Seo, D., Sabatinelli, D., & Patrick, C. J. (2016). Externalizing proneness and brain response during pre-cuing and viewing of emotionally evocative pictures. Social Cognitive and Affective Neuroscience, 11, 1102–1110.
- Forth, A. E., Kosson, D. S., & Hare, R. D. (2003). The Psychopathy Checklist: Youth Version manual (2nd ed.). Toronto: Multi-Health Systems.
- Fowles, D. C. (1980). The three arousal model: Implications of Gray's two-factor learning theory for heart rate, electrodermal activity, and psychopathy. *Psychophysiology*, 17, 87–104.
- Fowles, D. C., & Dindo, L. (2009). Temperament and psychopathy: A dual pathway model. Current Directions in Psychological Science, 18, 179–183.
- Fraley, R. C. (2002). Attachment stability from infancy to adulthood: Meta-analysis and dynamic modeling of developmental mechanisms. *Personality and Social Psychology Review*, 6, 123–151.
- Frick, P. J., & Hare, R. D. (2001). The Antisocial Process Screening Device (APSD). Toronto: Multi-Health Systems.
- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014). Can callous–unemotional traits enhance the understanding, diagnosis, and treatment of serious conduct problems in children and adolescents?: A comprehensive review. *Psychological Bulletin*, 140, 1–57.
- Gao, Y., & Raine, A. (2009). P3 event-related potential impairments in antisocial and psychopathic individuals: A meta-analysis. *Biological Psychology*, 82, 199–210.
- Gehring, W. J., & Willoughby, A. R. (2002). The medial frontal cortex and the rapid processing of monetary gains and losses. *Science*, 295, 2279–2282.
- Goldman-Rakic, P. S. (1996). The prefrontal landscape: Implications of functional architecture for understanding human mentation and the central executive. Philosophical Transactions of the Royal Society of London B: Biological Sciences, 351, 1445–1453.
- Gordon, H. L., Baird, A. A., & End, A. (2004). Functional differences among those high and low on a trait measure of psychopathy. *Biological Psychiatry*, 56, 516–521.
- Gough, H. G. (1960). Theory and measurement of socialization. Journal of Consulting Psychology, 24, 23–30.
- Goulter, N., Kimonis, E. R., Fanti, K. A., & Hall, J. R. (2015). Affective startle potentiation differentiates primary and secondary variants of juvenile psychopathy. Frontiers of Human Neuroscience Conference Abstracts: ASP2015—25th Annual Conference of the Australasian Society for Psychophysiology.

- Hall, J., Benning, S. D., & Patrick, C. J. (2004). Criterion-related validity of the three-factor model of psychopathy: Personality, behavior, and adaptive functioning. Assessment, 11, 4–16.
- Hall, J. R., Drislane, L. E., Murano, M., Patrick, C. J., Lilienfeld, S. O., & Poythress, N. G. (2014). Development and validation of Triarchic construct scales from the Psychopathic Personality Inventory. *Psychological Assessment*, 26, 447–461.
- Hare, R. D. (1965). Temporal gradient of fear arousal in psychopaths. *Journal of Abnormal Psychology*, 70, 442–445.
- Hare, R. D. (1978). Electrodermal and cardiovascular correlates of psychopathy. In R. D. Hare & D. Schalling (Eds.), *Psychopathic behavior: Approaches to research* (pp. 107–143). Chichester, UK: Wiley.
- Hare, R. D. (1980). A research scale for the assessment of psychopathy in criminal populations. *Personality* and Individual Differences, 1, 111–119.
- Hare, R. D. (1991). The Hare Psychopathy Checklist—Revised. Toronto: Multi-Health Systems.
- Hare, R. D. (2003). The Hare Psychopathy Checklist— Revised (2nd ed.). Toronto: Multi-Health Systems.
- Herpertz, S. C., Werth, U., Lukas, G., Qunaibi, M., Schuerkens, A., Kunert, H., et al. (2001). Emotion in criminal offenders with psychopathy and borderline personality disorder. Archives of General Psychiatry, 58, 737–744.
- Hicks, B. M., Markon, K. E., Patrick, C. J., Krueger, R. F., & Newman, J. P. (2004). Identifying psychopathy subtypes on the basis of personality structure. *Psychological Assessment*, 16, 276–288.
- Hicks, B. M., & Patrick, C. J. (2006). Psychopathy and negative affectivity: Analyses of suppressor effects reveal distinct relations with trait anxiety, depression, fearfulness, and anger-hostility. *Journal of Abnormal Psychology*, 115, 276–287.
- Howes, O. D., & Kapur, S. (2009). The dopamine hypothesis of schizophrenia: Version III—The final common pathway. Schizophrenia Bulletin, 34, 649– 652.
- John, O. P., Donahue, E. M., & Kentle, R. L. (1991). The Big Five Inventory—Versions 4a and 54 (Technical report). Berkeley: Institute of Personality and Social Research, University of California at Berkeley.
- Jones, A. P., Laurens, K. R., Herba, C. M., Barker, G. J., & Viding, E. (2009). Amygdala hypoactivity to fearful faces in boys with conduct problems and callous– unemotional traits. *American Journal of Psychiatry*, 166, 95–102.
- Justus, A. N., & Finn, P. R. (2007). Startle modulation in non-incarcerated men and women with psychopathic traits. *Personality and Individual Differences*, 43, 1057–1071.
- Karpman, B. (1941). On the need of separating psychopathy into two distinct clinical types: The symptomatic and the idiopathic. *Journal of Criminal Psychopathology*, 3, 112–137.
- Karpman, B. (1948). Conscience in the psychopath:

Another version. American Journal of Orthopsychiatry, 18, 455–491.

- Kaye, J. T., Bradford, D. E., & Curtin, J. J. (2016). Psychometric properties of startle and corrugator response in NPU, affective picture viewing, and resting state tasks. *Psychophysiology*, 53, 1241–1255.
- Kennedy, D. P., Glascher, J., Tyszka, J. M., & Adolphs, R. (2009). Personal space regulation by the human amygdala. Nature Neuroscience, 12, 1226–1227.
- Kochanska, G. (1997). Multiple pathways to conscience for children with different temperaments: From toddlerhood to age five. *Developmental Psychology*, 33, 228–240.
- Kotov, R., Krueger, R. F., Watson, D., Achenbach, T. M., Althoff, R. R., Bagby, M., et al. (2017). The Hierarchical Taxonomy of Psychopathology (HiTOP): A dimensional alternative to traditional nosologies. *Journal of Abnormal Psychology*, 126(4), 454–477.
- Kramer, M. D., Patrick, C. J., Krueger, R. F., & Gasperi, M. (2012). Delineating physiological defensive reactivity in the domain of self-report: Phenotypic and etiologic structure of dispositional fear. *Psychological Medicine*, 42, 1305–1320.
- Krueger, R. F., Caspi, A., Moffitt, T. E., Silva, P. A., & McGee, R. (1996). Personality traits are differentially linked to mental disorders: A multitrait-multidiagnosis study of an adolescent birth cohort. *Journal of Abnormal Psychology*, 105, 299–312.
- Krueger, R. F., Hicks, B., Patrick, C. J., Carlson, S., Iacono, W. G., & McGue, M. (2002). Etiologic connections among substance dependence, antisocial behavior, and personality: Modeling the externalizing spectrum. *Journal of Abnormal Psychology*, 111, 411–424.
- Krueger, R. F., Markon, K. E., Patrick, C. J., Benning, S. D., & Kramer, M. (2007). Linking antisocial behavior, substance use, and personality: An integrative quantitative model of the adult externalizing spectrum. *Journal of Abnormal Psychology*, 116, 645–666.
- Kyranides, M. N., Fanti, K., Sikki, M., & Patrick, C. J. (2017). Triarchic dimensions of psychopathy in young adulthood: Associations with clinical and physiological measures after accounting for adolescent psychopathic traits. Personality Disorders: Theory, Research, and Treatment, 8, 140–149.
- Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (1990). Emotion, attention, and the startle reflex. *Psychological Review*, 97, 377–398.
- Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (1997). Motivated attention: Affect, activation, and action. In P. J. Lang, R. F. Simons, & M. T. Balaban (Eds.), Attention and orienting: Sensory and motivational processes (pp. 97–135). Hillsdale, NJ: Erlbaum.
- LeDoux, J. E. (1995). Emotion: Clues from the brain. Annual Review of Psychology, 46, 209–235.
- LeDoux, J. E. (2000). Emotion circuits in the brain. Annual Review of Neuroscience, 23, 155–184.
- LeDoux, J. E. (2015). Anxious: Using the brain to under-

stand and treat fear and anxiety. New York: Viking Press.

- Levenson, M. R., Kiehl, K. A., & Fitzpatrick, C. M. (1995). Assessing psychopathic attributes in a noninstitutionalized population. *Journal of Personality and Social Psychology*, 68, 151"158.
- Levenston, G. K., Patrick, C. J., Bradley, M. M., & Lang, P. J. (2000). The psychopath as observer: Emotion and attention in picture processing. *Journal of Abnormal Psychology*, 109, 373–385.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment*, 66, 488–524.
- Lilienfeld, S. O., & Widows, M. R. (2005). Psychopathic Personality Inventory—Revised (PPI-R) professional manual. Odessa, FL: Psychological Assessment Resources.
- Linden, D. E. J. (2005). The P300: Where in the brain is it produced and what does it tell us? *The Neurosci*entist, 11, 563–576.
- Lissek, S., Orme, K., McDowell, D. J., Johnson, L. L., Luckenbaugh, D. A., Baas, J. M., et al. (2007). Emotion regulation and potentiated startle across affective picture and threat-of-shock paradigms. *Biological Psychology*, 76, 124–133.
- Lockwood, P. L., Sebastian, C. L., McCrory, E. J., Hyde, Z. H., Gu, X., De Brito, S. A., et al. (2013). Association of callous traits with reduced neural response to others' pain in children with conduct problems. *Current Biology*, 23, 901–905.
- López, R., Poy, R., Patrick, C. J., & Moltó, J. (2013). Deficient fear conditioning and self-reported psychopathy: The role of fearless dominance. *Psychophysiology*, 50, 210–218.
- Lykken, D. T. (1957). A study of anxiety in the sociopathic personality. *Journal of Abnormal and Clinical Psychology*, 55, 6–10.
- Lykken, D. T. (1968). Statistical significance in psychological research. Psychological Bulletin, 70, 151–159.
- Lykken, D. T. (1995). The antisocial personalities. Hillsdale, NJ: Erlbaum.
- Lynam, D. R. (1996). Early identification of chronic offenders: Who is the fledgling psychopath? *Psychological Bulletin*, 120, 209–234.
- MacDonald, A. W., III, Cohen, J. D., Stenger, V. A., & Carter, C. S. (2000). Dissociating the role of dorsolateral prefrontal and anterior cingulate cortex in cognitive control. *Science*, 288, 1835–1838.
- Markon, K. E., Krueger, R. F., & Watson, D. (2005). Delineating the structure of normal and abnormal personality: An integrative hierarchical approach. *Journal of Personality and Social Psychology*, 88, 139–157.
- Marsh, A. A., & Blair, R. J. R. (2008). Deficits in facial affect recognition among antisocial populations: A meta-analysis. *Neuroscience and Biobehavioral Re*views, 32(3), 454–465.

Marsh, A. A., Finger, E. C., Fowler, K. A., Adalio, C.

J., Jurkowitz, I. T., Schechter, J. C., et al. (2013). Empathic responsiveness in amygdala and anterior cingulate cortex in youths with psychopathic traits. *Journal of Child Psychology and Psychiatry*, 54, 900– 910.

- Marsh, A. A., Finger, E. C., Mitchell, D. G., Reid, M. E., Sims, C., Kosson, D. S., et al. (2008). Reduced amygdala response to fearful expressions in children and adolescents with callous–unemotional traits and disruptive behavior disorders. *American Journal of Psychiatry*, 165, 712–720.
- McCord, W., & McCord, J. (1964). The psychopath: An essay on the criminal mind. Princeton, NJ: Van Nostrand.
- McGue, M., Zhang, Y., Miller, M. B., Basu, S., Vrieze, S., Hicks, B., et al. (2013). A genome-wide association study of behavioral disinhibition. *Behavior Genetics*, 43, 363–373.
- Meffert, H., Gazzola, V., den Boer, J. A., Bartels, A. A., & Keysers, C. (2013). Reduced spontaneous but relatively normal deliberate vicarious representations in psychopathy. Brain, 136, 2550–2562.
- Mikulincer, M., & Shaver, P. R. (2007). Attachment in adulthood: Structure, dynamics and change. New York. Guilford Press.
- Miller, E. K., & Cohen, J. D. (2001). An integrative theory of prefrontal cortex function. Annual Review of Neuroscience, 24, 167–202.
- Miller, J. D., Lamkin, J., Maples-Keller, J. L., & Lynam, D. R. (2016). Viewing the triarchic model of psychopathy through general personality and expert-based lenses. *Personality Disorders: Theory, Research, and Treatment*, 7, 247–258.
- Miller, J. D., Lynam, D. R., Widiger, T. A., & Leukefeld, C. (2001). Personality disorders as extreme variants of common personality dimensions: Can the five-factor model adequately represent psychopathy? *Journal* of *Personality*, 69, 253–276.
- Miller, J. D., Rausher, S., Hyatt, C. S., Maples, J., & Zeichner, A. (2014). Examining the relations among pain tolerance, psychopathic traits, and violent and nonviolent antisocial behavior. *Journal of Abnormal Psychology*, 123(1), 205–213.
- Montague, P. R., Hyman, S. E., & Cohen, J. D. (2004). Computational roles for dopamine in behavioural control. *Nature*, 431, 760–767.
- Morgan, A. B., & Lilienfeld, S. O. (2000). A meta-analytic review of the relation between antisocial behavior and neuropsychological measures of executive function. Clinical Psychology Review, 20, 113–136.
- Moul, C., Killcross, S., & Dadds, M. R. (2012). A model of differential amygdala activation in psychopathy. *Psychological Review*, 119, 789–806.
- Müri, R. M., Heid, O., Nirkko, A. C., Ozdoba, C., Felblinger, J., Schroth, G., et al. (1998). Functional organisation of saccades and antisaccades in the frontal lobe in humans: A study with echo planar functional magnetic resonance imaging. *Journal of Neurology*, *Neurosurgery, and Psychiatry*, 65, 374–377.

- Nelson, L. D., Patrick, C. J., & Bernat, E. M. (2011). Operationalizing proneness to externalizing psychopathology as a multivariate psychophysiological phenotype. *Psychophysiology*, 48, 64–72.
- Newman, J. P., Curtin, J. J., Bertsch, J. D., & Baskin-Sommers, A. R. (2010). Attention moderates the fearlessness of psychopathic offenders. *Biological Psychiatry*, 67, 66–70.
- Nigg, J. T., & Casey, B. J. (2005). An integrative theory of attention-deficit hyperactivity disorder based on the cognitive and affective neurosciences. *Development and Psychopathology*, 17, 785–806.
- Ogilvie, J. M., Stewart, A. L., Chan, R. C. K., & Shum, D. H. K. (2011) Neuropsychological measures of executive function and antisocial behavior: A metaanalysis. *Criminology*, 49, 1063–1107.
- Öhman, A. (1993). Fear and anxiety as emotional phenomena: Clinical phenomenology, evolutionary perspectives, and information processing mechanisms. In M. Lewis & J. M. Haviland (Eds.), *Handbook of emotions* (pp. 511–536). New York: Guilford Press.
- Orban, S. A., Rapport, M. D., Friedman, L. M., & Kofler, M. J. (2014). Executive function/cognitive training for children with ADHD: Do results warrant the hype and cost? *The ADHD Report*, 22, 8–14.
- Otowa, T., Hek, K., Lee, M., Byrne, E. M., Mirza, S. S., Nivard, M. G., et al. (2016). Meta-analysis of genomewide association studies of anxiety disorders. *Molecular Psychiatry*, 21, 1391–1399.
- Pasion, R., Fernandes, C., Pereira, M. R., & Barbosa, F. (2017). Antisocial behaviour and psychopathy: Uncovering the externalizing link in the P3 modulation. *Neuroscience and Behavioral Reviews*. [Epub ahead of print]
- Pastor, M. C., Moltó, J., Vila, J., & Lang, P. J. (2003). Startle reflex modulation, Affective ratings and Autonomic reactivity in Spanish incarcerated psychopaths. *Psychophysiology*, 40, 934–938.
- Patrick, C. J. (1994). Emotion and psychopathy: Startling new insights. Psychophysiology, 31, 319–330.
- Patrick, C. J. (2006). Back to the future: Cleckley as a guide to the next generation of psychopathy research. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 605–617). New York: Guilford Press.
- Patrick, C. J. (2014). Physiological correlates of psychopathy, antisocial personality disorder, habitual aggression, and violence. In V. Kumari, N. Boutros, & P. Bob (Eds.), Current topics in behavioral neuroscience: Vol. 14. Psychophysiology in psychiatry and psychopharmacology (pp. 197–226). New York: Springer.
- Patrick, C. J., & Bernat, E. M. (2009). From markers to mechanisms: Using psychophysiological measures to elucidate basic processes underlying aggressive externalizing behavior. In S. Hodgins, E. Viding, & A. Plodowski (Eds.), Persistent violent offenders: Neuroscience and rehabilitation (pp. 223–250). London: Oxford University Press.
- Patrick, C. J., Berthot, B. D., & Moore, J. D. (1996).

Diazepam blocks fear-potentiated startle in humans. Journal of Abnormal Psychology, 105, 89–96.

- Patrick, C. J., Bradley, M. M., & Lang, P. J. (1993). Emotion in the criminal psychopath: Startle reflex modulation. *Journal of Abnormal Psychology*, 102, 82–92.
- Patrick, C. J., & Drislane, L. E. (2015). Triarchic model of psychopathy: Origins, operationalizations, and observed linkages with personality and general psychopathology. *Journal of Personality*, 83, 627–643.
- Patrick, C. J., Drislane, L. E., & Strickland, C. (2012). Conceptualizing psychopathy in triarchic terms: Implications for treatment. *International Journal of Forensic Mental Health*, 11, 253–266.
- Patrick, C. J., Durbin, C. E., & Moser, J. S. (2012). Conceptualizing proneness to antisocial deviance in neurobehavioral terms. *Development and Psychopathol*ogy, 24, 1047–1071.
- Patrick, C. J., Foell, J., Venables, N. C., & Worthy, D. A. (2016). Substance use disorders as externalizing outcomes. In T. P. Beauchaine & S. P. Hinshaw (Eds.), Oxford handbook of externalizing spectrum disorders (pp. 38–60). New York: Oxford University Press.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, 21, 913–938.
- Patrick, C. J., Hicks, B. M., Krueger, R. F., & Lang, A. R. (2005). Relations between psychopathy facets and externalizing in a criminal offender sample. *Journal* of Personality Disorders, 19, 339–356.
- Patrick, C. J., Hicks, B. M., Nichol, P. E., & Krueger, R. F. (2007). A bifactor approach to modeling the structure of the Psychopathy Checklist-Revised. *Journal of Personality Disorders*, 21, 118–141.
- Patrick, C. J., Venables, N. C., & Skeem, J. L. (2012). Psychopathy and brain function: Empirical findings and legal implications. In H. Häkkänen-Nyholm & J. Nyholm (Eds.), *Psychopathy and law: A practitioner's guide* (pp. 39–77). New York: Wiley.
- Patrick, C. J., Venables, N. C., Yancey, J. R., Hicks, B. M., Nelson, L. D., & Kramer, M. D. (2013). A construct-network approach to bridging diagnostic and physiological domains: Application to assessment of externalizing psychopathology. *Journal of Abnormal Psychology*, 122, 902–916.
- Patterson, C. M., & Newman, J. P. (1993). Reflectivity and learning from aversive events: Toward a psychological mechanism for the syndromes of disinhibition. Psychological Review, 100, 716–736.
- Patterson, G. R., Reid, J. B., & Dishion, T. J. (1992). Antisocial boys. Eugene, OR: Castalia.
- Paulhus, D. L., Neumann, C. S., & Hare, R. D. (2015). Manual for the Self-Report Psychopathy Scale (4th ed.). Toronto: Multi-Health Systems.
- Paulmann, S., & Pell, M. D. (2009). Facial expression decoding as a function of emotional meaning status: ERP evidence. *NeuroReport*, 20, 1603–1608.
- Perkins, E. R., Yancey, J. R., Drislane, L. D., Venables, N. C., Balsis, S., & Patrick, C. J. (2017). Methodological

issues in the use of individual brain meaures to index trait liabilities: The example of noise-probe P3. *International Journal of Psychophysiology*, 111, 245–255.

- Petrides, M. (2000). Dissociable roles of mid-dorsolateral prefrontal and anterior inferotemporal cortex in visual working memory. *Journal of Neuroscience*, 20, 7496–7503.
- Pizzagalli, D. A. (2014). Depression, stress, and anhedonia: Toward a synthesis and integrated model. Annual Review of Clinical Psychology, 10, 393–423.
- Porter, S. (1996). Without conscience or without active conscience?: The etiology of psychopathy revisited. Aggression and Violent Behavior, 1, 179–189.
- Poy, R., Segarra, P., Esteller, À., López, R., & Moltó, J. (2014). FFM description of the triarchic conceptualization of psychopathy in men and women. *Psychological Assessment*, 26, 69–76.
- Poythress, N. G., Edens, J. F., Skeem, J. L., Lilienfeld, S. O., Douglas, K. S., Frick, P. J., et al. (2010). Using psychopathy and psychopathy-related constructs to parse the heterogeneity of antisocial personality disorder. *Journal of Abnormal Psychology*, 119, 389–400.
- Robinson, T. E., & Berridge, K. C. (2000). The psychology and neurobiology of addiction: An incentivesensitization view. Addiction, 95, S91–S117.
- Rolls, E. T. (2000). The orbitofrontal cortex and reward. *Cerebral Cortex*, 10, 284–294.
- Rothbart, M. K., & Sheese, B. E. (2007). Temperament and emotion regulation. In J. J. Gross (Ed.), Handbook of emotion regulation (pp. 331–350). New York: Guilford Press.
- Rothemund, Y., Ziegler, S., Hermann, C., Gruesser, S. M., Foell, J., Patrick, C. J., et al. (2012). Fear conditioning in psychopaths: Event-related potentials and peripheral measures. *Biological Psychology*, 90, 50–59.
- Scheffers, M., Coles, M. G. H., Bernstein, P., Gehring, W. J., & Donchin, E. (1996). Event-related potentials and error-related processing: An analysis of incorrect responses to go and no-go stimuli. *Psychophysiology*, 33, 42–53.
- Schmauk, F. J. (1970). Punishment, arousal, and avoidance learning in sociopaths. *Journal of Abnormal Psychology*, 76, 325–335.
- Schneider, F., Habel, U., Kessler, C., Posse, S., Grodd, W., & Muller-Gartner, H. (2000). Functional imaging of conditioned aversive emotional responses in antisocial personality disorder. *Neuropsychobiology*, 42, 192–201.
- Seara-Cardoso, A., Viding, E., Lickley, R. A., & Sebastian, C. L. (2015). Neural responses to others' pain vary with psychopathic traits in healthy males. *Cognitive, Affective, and Behavioral Neuroscience, 15*, 578–588.
- Sellbom, M., & Phillips, T. R. (2013). An examination of the triarchic conceptualization of psychopathy in incarcerated and non-incarcerated samples. *Journal* of Abnormal Psychology, 122, 208–214.
- Shannon, R. W., Patrick, C. J., Venables, N. C., & He,

S. (2013). "Faceness" and affectivity: Evidence for genetic contributions to distinct components of electrocortical response to human faces. *NeuroImage*, *83*, 609–615.

- Simons, R. F., & Zelson, M. F. (1985). Engaging visual stimuli and reflex blink modulation. *Psychophysiol*ogy, 22, 44–49.
- Skeem, J., Johansson, P., Andershed, H., Kerr, M., & Eno Louden, J. (2007). Two subtypes of psychopathic violent offenders that parallel primary and secondary variants. *Journal of Abnormal Psychology*, 116, 395–409.
- Stevens, D., Charman, T., & Blair, R. J. R. (2001). Recognition of emotion in facial expressions and vocal tones in children with psychopathic tendencies. *Journal of Genetic Psychology*, 162, 201–211.
- Sutton, S. K., Vitale, J. E., & Newman, J. P. (2002). Emotion among females with psychopathy during picture perception. *Journal of Abnormal Psychology*, 111, 610–619.
- Tellegen, A. (2011). Multidimensional Personality Questionnaire. Minneapolis: University of Minnesota Press.
- Tellegen, A., & Waller, N. G. (2008). Exploring personality through test construction: Development of the Multidimensional Personality Questionnaire. In G. J. Boyle, G. Matthews, & D. H. Saklofske (Eds.), Handbook of personality theory and testing: Personality measurement and assessment (Vol. 2, pp. 261–292). London: SAGE.
- Tharp, V. K., Maltzman, I., Syndulko, K., & Ziskind, E. (1980). Autonomic activity during anticipation of an aversive tone in noninstitutionalized sociopaths. *Psychophysiology*, 17, 123–128.
- Trull, T. J. (1992). DSM-III-R personality disorders and the five-factor model of personality: An empirical comparison. Journal of Abnormal Psychology, 101, 553–560.
- Trull, T. J. (1994). Relationship between the five-factor model of personality and Axis I disorders in a nonclinical sample. *Journal of Abnormal Psychology*, 103, 350–360.
- Vaidyanathan, U., Hall, J. R., Patrick, C. J., & Bernat, E. M. (2011). Clarifying the role of defensive reactivity deficits in psychopathy and antisocial personality using startle reflex methodology. *Journal of Abnormal Psychology*, 120, 253–258.
- Vaidyanathan, U., Patrick, C. J., & Bernat, E. M. (2009). Startle reflex potentiation during aversive picture viewing as an index of trait fear. *Psychophysiology*, 46, 75–85.
- Vanman, E. J., Mejia, V. Y., Dawson, M. E., Schell, A. M., & Raine, A. (2003). Modification of the startle reflex in a community sample: Do one or two dimensions of psychopathy underlie emotional processing? *Personality and Individual Differences*, 35, 2007–2021.
- Venables, N. C., Foell, J., Yancey, J. R., Kane, M. J., Engle, R. W., & Patrick, C. J. (in press). Quantify-

ing inhibitory control as externalizing proneness: A cross-domain model. *Clinical Psychological Science*.

- Venables, N. C., Hall, J. R., & Patrick, C. J. (2014). Differentiating psychopathy from antisocial personality disorder: A triarchic model perspective. *Psychological Medicine*, 44, 1005–1013.
- Venables, N. C., Hicks, B. M., Yancey, J. R., Kramer, M. D., Nelson, L. D., Strickland, C. S., et al. (2017). Evidence of a prominent genetic basis for relations between psychoneurometric traits and common mental disorders. *International Journal of Psychophysiology*, 115, 4–12.
- Venables, N. C., & Patrick, C. J. (2014) Reconciling discrepant findings for P3 brain response in criminal psychopathy through reference to the concept of externalizing proneness. *Psychophysiology*, 51, 427–436.
- Verona, E., Bresin, K. W., & Patrick, C. J. (2013). Revisiting psychopathy in women: Cleckley/Hare conceptions and affective response. *Journal of Abnormal Psychology*, 122, 1088–1093.
- Verona, E., Patrick, C. J., & Joiner, T. T. (2001). Psychopathy, antisocial personality, and suicide risk. *Journal of Abnormal Psychology*, 110, 462–470.
- Verweij, K. J. H., Zietsch, B. P., Medland, S. E., Gordon, S. D., Benyamin, B., Nyholt, D. R., et al. (2010). A genome-wide association study of Cloninger's Temperament scales: Implications for the evolutionary genetics of personality. *Biological Psychology*, 85, 306–317.
- Viding, E., Hanscombe, K. B., Curtis, C. J., Davis, O. S., Meaburn, E. L., & Plomin, R. (2010). In search of genes associated with risk for psychopathic tendencies in children: A two-stage genome-wide association study of pooled DNA. *Journal of Child Psychology* and Psychiatry, 51, 780–788.
- Viding, E., Price, T. S., Jaffee, S. R., Trzaskowski, M., Davis, O. S. P., Meaburn, E. L., et al. (2013). Genetics of callous–unemotional behavior in children. PLOS ONE, 8(7), e65789.
- Viding, E., Sebastian, C. L., Dadds, M. R., Lockwood, P. L., Cecil, C. A., De Brito, S. A., et al. (2012). Amygdala response to preattentive masked fear in children with conduct problems: The role of callous–unemotional traits. American Journal of Psychiatry, 169, 1109–1116.
- Vieira, J. B., & Marsh, A. A. (2014). Don't stand so close to me: Psychopathy and the regulation of interpersonal distance. Frontiers in Human Neuroscience, 7, Article 907.
- Volkow, N. D., Wang, G. J., Kollins, S. H., Wigal, T. L., Newcorn, J. H., Telang, F., et al. (2009). Evaluating dopamine reward pathway in ADHD: Clinical implications. Journal of the American Medical Association, 302, 1084–1091.
- Wagar, B. M., & Thagard, P. (2004). Spiking Phineas Gage: A neurocomputational theory of cognitive–affective integration in decision-making. *Psychological Review*, 111, 67–79.
- Waid, W. M., & Orne, M. T. (1982). Reduced electrodermal response to conflict, failure to inhibit domi-

nant behaviors, and delinquency proneness. *Journal* of Personality and Social Psychology, 43, 769–774.

- Wall, T. D., Wygant, D. B., & Sellbom, M. (2015). Boldness explains a key difference between psychopathy and antisocial personality disorder. *Psychiatry*, *Psychology and Law*, 22, 94–105.
- Weidacker, K., Snowdon, R. J., Boy, F., & Johnston, S. J. (2017). Response inhibition in the parametric go/ no-go task in psychopathic offenders. *Psychiatry Re*search, 250, 256–263.
- Whalen, P. J., Rauch, S. L., Etcoff, N. L., McInerney, S. C., Lee, M., & Jenike, M. A. (1998). Masked presentations of emotional facial expressions modulate amygdala activity without explicit knowledge. *Journal of Neuroscience*, 18, 411–418.
- White, S. F., Marsh, A. A., Fowler, K. A., Schechter, J. C., Adalio, C., Pope, K., et al. (2012). Reduced amygdala response in youths with disruptive behavior disorders and psychopathic traits: Decreased emotional response versus increased top-down attention to nonemotional features. *American Journal of Psychia*try, 169, 750–758.
- White, S. F., Williams, W. C., Brislin, S. J., Sinclair, S., Blair, K. S., Fowler, K. A., et al. (2012). Reduced activity within the dorsal endogenous orienting of attention network to fearful expressions in youth with disruptive behavior disorders and psychopathic traits. *Development and Psychopathology*, 24, 1105–1116.
- Winkielman, P., Berridge, K. C., & Wilbarger, J. L. (2005). Unconscious affective reactions to masked happy versus angry faces influence consumption behavior and judgments of value. *Personality and Social Psychology Bulletin*, 31, 121–135.
- Wise, S. P., Murray, E. A., & Gerfen, C. R. (1996). The frontal-basal ganglia system in primates. *Critical Re*views in Neurobiology, 10, 317–356.
- Yancey, J. R., Venables, N. C., Hicks, B. M., & Patrick, C. J. (2013). Evidence for a heritable brain basis to deviance-promoting deficits in self-control. *Journal of Criminal Justice*, 41, 309–317.
- Yancey, J. R., Venables, N. C., & Patrick, C. J. (2016). Psychoneurometric operationalization of threat sensitivity: Relations with clinical symptom and physiological response criteria. *Psychophysiology*, 53, 393–405.
- Young, S. E., Friedman, N. P., Miyake, A., Willcutt, E. G., Corley, R. P., Haberstick, B. C., et al. (2009). Behavioral disinhibition: Liability for externalizing spectrum disorders and its genetic and environmental relation to response inhibition across adolescence. *Journal of Abnormal Psychology*, 118, 117–130.
- Young, S. E., Stallings, M. C., Corley, R. P., Krauter, K. S., & Hewitt, J. K. (2000). Genetic and environmental influences on behavioral disinhibition. *American Journal of Medical Genetics*, 96, 684–695.
- Ziskind, E., Syndulko, K., & Maltzman, I. (1978). Aversive conditioning in the sociopath. Pavlovian Journal of Biological Science, 13, 199–205.

### CHAPTER 19

# Psychopathy and Developmental Pathways to Antisocial Behavior in Youth

#### PAUL J. FRICK MONICA A. MARSEE

he constellation of affective (e.g., poverty of emotions, lack of empathy, and guilt), interpersonal (e.g., callous use of others for one's own gain), self-referential (e.g., inflated sense of one's own importance), and behavioral (e.g., impulsivity and irresponsibility) traits associated with the construct of psychopathy have proven to be quite important for designating a distinct group of antisocial adults. Research has consistently shown that incarcerated adults who exhibit psychopathic traits show a more severe and violent pattern of antisocial behavior, both within the institution and after release (Leistico, Salekin, DeCoster, & Rogers, 2008). In addition, incarcerated adults with psychopathic features show a number of distinct cognitive, affective, and neurological characteristics that seem to implicate different causal processes in the development of antisocial behavior compared to incarcerated adults without psychopathic features (Blair, Mitchell, & Blair, 2005). Thus, the construct of psychopathy has many important legal, mental health, and scientific implications. Furthermore, adults with psychopathic traits typically have long histories of antisocial behavior that begin early in childhood (Hare, McPherson, & Forth, 1988). As a result, there have been a number of attempts to define

developmental precursors to psychopathy in an effort to better understand the causes of this severe and debilitating condition, and to design interventions that can be implemented early in development, when tendencies toward psychopathy are potentially more changeable (Frick, 2012).

Studying traits characteristic of psychopathy prior to adulthood may also help in developing better causal models for severe antisocial and aggressive behavior in youth. As with antisocial behavior in adulthood, research has clearly demonstrated marked heterogeneity among antisocial youth (Frick & Nigg, 2012). For example, the most persistent 5-6% of youthful offenders account for about 50% of reported crimes (Farrington, Ohlin, & Wilson, 1986). Recent causal theories of antisocial behavior have also posited different causal pathways through which children develop serious conduct problems (Frick & Viding, 2009). As a result, a number of approaches to subtyping antisocial youth have been proposed in an effort to capture these distinct causal pathways (Frick & Nigg, 2012). Unfortunately, no approach to subtyping has garnered widespread acceptance over an extended period. Given the utility that the construct of psychopathy has shown for designating an important subgroup of antisocial adults, it is quite possible that extending the construct earlier in development could similarly enhance these attempts to define meaningful subtypes of antisocial youth.

Our purpose in this chapter is to review research that has attempted to define meaningful subgroups of antisocial and aggressive youth, focusing on approaches that appear to be particularly important for extending the construct of psychopathy to younger samples. In reviewing these approaches, we attempt to highlight their similarities and points of divergence with the construct of psychopathy, as defined for adults, and their potential relevance for developmental models of psychopathy. In the final section, we outline some critical issues that we believe should be prioritized in future research directed at extending the construct of psychopathy to youth.

#### Subtypes Based on Aggressive Behavior

As noted earlier, psychopathy has been associated with a particularly aggressive and violent pattern of behavior in incarcerated adults. Similarly, a sizable portion of children with serious conduct problems also show aggressive behavior, and some approaches to subtyping antisocial youth have focused on whether or not they are aggressive (Frick & Nigg, 2012). The importance of this distinction is supported by research showing that aggressive behavior in children is often quite stable across the lifespan (Huesmann, Eron, Lefkowitz, & Walder, 1984) and is very difficult to treat (Frick, 2012). Furthermore, research suggests that several distinct types of aggression may be displayed by children, and distinguishing among these types may be important for understanding distinct causal pathways to childhood conduct problems and for developmental models of psychopathy. Specifically, children and adolescents may differ in the form of aggression they use (i.e., overt or relational aggression), as well as the function that their aggressive behavior serves (i.e., retaliatory [reactive] vs. goal-oriented [proactive]) (Marsee et al., 2011).

The overt form of aggression harms others by damaging their physical well-being and includes aggressive behaviors such as hitting, pushing, kicking, and threatening (Coie & Dodge, 1998). Maladjustment associated with this type of aggression has been documented for decades (Coie & Dodge, 1998) and it is this form of aggression that has been most consistently associated with psychopathy (Leistico et al., 2008). In contrast, relational aggression harms others by damaging social relationships, friendships, or feelings of inclusion and acceptance in the peer group (Crick et al., 1999). Aggression of this type includes behaviors such as gossiping about others, excluding target children from a group, spreading rumors, or telling others not to be friends with a target child (Björkqvist, Lagerspetz, & Kaukiainen, 1992; Crick & Grotpeter, 1995; Lagerspetz, Björkqvist, & Peltonen, 1988). This form of aggression is also associated with a host of social and psychological problems (see Marsee & Frick, 2010, for a review).

An important question relevant to the overtrelational distinction concerns potential gender differences. Specifically, meta-analytic results indicate that boys tend to engage in more overt aggression than girls, whereas gender differences tend to be small or negligible for relational aggression (Card, Stucky, Sawalani, & Little, 2008). Despite similar levels of relational aggression across genders, many studies indicate that aggression of this type predicts problems in adjustment above and beyond overt aggression more consistently for girls than for boys (e.g., Crick, 1996; Crick & Grotpeter, 1995; Prinstein, Boergers, & Vernberg, 2001). An explanation for the better prognostic significance of relational aggression in girls is provided by findings from studies using personcentered analyses indicating that, in contrast with tendencies toward both overt and relational aggression shown by aggressive boys, an appreciable number of girls show elevated levels of relational aggression only, and relationally aggressive girls show problems in adjustment (Crapanzano, Frick, & Terranova, 2010; Marsee et al., 2014). Therefore, because relational aggression occurs mainly in conjunction with overt aggression in boys, it is not clearly associated with problems in adjustment after controlling for overt aggression in male samples. Because it does occur more frequently in the absence of overt aggression in female samples, relational aggression shows more of a unique association with problems in adjustment in girls.

Thus, considering relational aggression in children and adolescents may have important implications for understanding unique causal pathways to serious conduct problems and for developmental models of psychopathy, especially for girls. In support of this possibility, research in adults has found that relational aggression is more associated with psychopathic traits in women than in men (Miller & Lynam, 2003; Ostrov & Houston, 2008). Similar findings have been reported for adolescent girls in both community (Marsee, Silverthorn, & Frick, 2005) and detained samples (Marsee & Frick, 2007; Stickle, Marini, & Thomas, 2012). Furthermore, Pardini, Stepp, Hipwell, Stouthamer-Loeber, and Loeber (2012) reported that in a community sample of 1,862 girls ages 6–8 years, those with both serious conduct problems and psychopathic traits showed higher levels of relational aggression at both baseline and across a 6-year follow-up period compared to girls with serious conduct problems only.

While the importance of distinguishing between overt and relational aggression for developmental models of psychopathy has only recently been the focus of research, there has been a long history of work investigating the importance of the functions of aggression for understanding psychopathy. Specifically, research has consistently distinguished between reactive aggression, which occurs as an angry response to provocation or threat (e.g., Berkowitz, 1993), and proactive aggression, which is typically unprovoked and often used for instrumental gain or dominance over others (Dodge & Coie, 1987). Research with incarcerated adults and adolescents suggests that severe patterns of violence that include instrumental and premeditated aggression are associated with psychopathic traits (Cornell et al., 1996; Kruh, Frick, & Clements, 2005; Lawing, Frick, & Cruise, 2010; Patrick, Zempolich, & Levenston, 1997; Woodworth & Porter, 2002). One point of importance for understanding this link between psychopathy and proactive aggression is the fact that reactive and proactive aggression are highly correlated (Card & Little, 2006) but exhibit some asymmetry in their overlap (Marsee et al., 2014). In particular, research suggests that whereas most people who engage in high levels of proactive aggression also engage in high rates of reactive aggression, a large number of people engage in only reactive forms of aggression (Marsee et al., 2014). Thus, psychopathic traits appear to be associated with a pattern of aggression that includes both reactive and proactive aggression, whereas persons without elevated psychopathic traits tend to show less severe aggression overall that is limited mainly to reactive forms (Cornell et al., 1995; Frick, Cornell, Barry, Bodin, & Dane, 2003; Kruh et al., 2005; Marsee et al., 2014; Stickle et al., 2012).

Along with differing on measures of psychopathic traits, children and adolescents with these contrasting patterns of aggressive behavior also show a number of distinct emotional, cognitive, and social characteristics that may be important for causal theories of serious conduct problems. Specifically, reactively aggressive children show higher rates of anger and other problems related to emotional regulation (Marsee & Frick, 2007; McAuliffe, Hubbard, Rubin, Morrow, & Dearing, 2007). They also show a tendency to attribute hostile intent to ambiguous provocations by peers, and they have difficulty developing nonaggressive solutions to problems in social interactions (Crick & Dodge, 1996). To illustrate these characteristics. Marsee and Frick (2007) examined the differential correlates of reactive and proactive aggression in detained adolescent girls and found that self-reported reactive aggression was associated with measures of poorly regulated emotion and anger in response to perceived provocation. These problems in emotional regulation may explain the finding that reactive aggression in girls is more strongly associated with adjustment problems in school, including peer rejection (Dodge, Lochman, Harnish, Bates, & Pettit, 1997).

In contrast, children who are high on proactive aggression often do not show these problems in emotional regulation (Dodge et al., 1997; Vitaro, Brendgen, & Tremblay, 2002) and instead sometimes show reduced levels of emotional reactivity (Marsee & Frick, 2007; McAuliffe et al., 2007; Pitts, 1997; Xu, Raine, Yu, & Krieg, 2014). For example, Pitts (1997) reported on a sample of third- through sixth-grade boys comprising three groups: nonaggressive, reactive aggressive, and reactive-proactive aggressive. Both groups of aggressive children exhibited lower rates of resting heart rate than the nonaggressive group. However, in response to a simulated provocation from peers, heart rate increased significantly more for members of the reactive group compared to nonaggressive controls, whereas heart rate remained low among members of the reactive-proactive group. In addition to these emotional characteristics, proactively aggressive children overestimate the possible positive consequences of their aggressive behavior (Dodge et al., 1997).

In summary, research on the characteristics of children and adolescents exhibiting significant levels of instrumental aggression suggests that they show both higher rates of psychopathic traits and a specific pattern of emotional and cognitive responding to interpersonal situations involving peer conflict. These results lead to an interesting, yet relatively unexplored, question as to whether the emotional and cognitive characteristics of these children are more strongly or uniquely associated with instrumental aggression or with psychopathic traits. In one of the few tests of this question, Muñoz, Frick, Kimonis, and Aucoin (2008) reported on a sample of 85 adolescent boys (ages 13–18 years) in a juvenile detention center who played a competitive computer task against a hypothetical peer who provided low and high levels of provocation. Adolescents high on both self-reported reactive and instrumental aggression differed in behavioral responses to provocation compared to youth high on reactive aggression only. Specifically, the combined group showed high levels of aggressive responses without any provocation, whereas the pure reactive aggression group showed increased aggressive responding only with provocation. Importantly, the results revealed a trend for the combined group to show lower levels of skin conductance reactivity in response to low provocation. However, this was only the case if they also scored high on the affective dimension of psychopathy. This finding suggests that some of the emotional characteristics that have been attributed to youth with instrumental aggression may actually be more specifically associated with the psychopathic traits they often display.

#### Childhood- and Adolescent-Onset Conduct Problems

Another approach to designating subgroups of children with severe conduct problems that has been the subject of substantial research (for reviews, see Frick & Viding, 2009; Moffitt, 2006) and is included in the diagnostic criteria for conduct disorder (CD) in the most recent edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association [APA], 2013) distinguishes between children who begin showing severe conduct problems in childhood and children whose onset of severe antisocial behavior coincides with the onset of puberty. Children in the childhood-onset group often begin showing mild oppositional and defiant behaviors early in childhood (i.e., preschool or early elementary school), and their behavioral problems tend to increase in rate and severity throughout childhood and into adolescence (Lahey & Loeber, 1994). In contrast, members of the adolescent-onset group do not show significant behavioral problems in childhood but begin exhibiting significant antisocial and delinquent behavior during adolescence (Hinshaw, Lahey, & Hart, 1993; Moffitt, 2006). Along with differing patterns of onset, there are important differences in the severity of behavior and outcome for these two subgroups of antisocial youth. Specifically, analyses of data from a New Zealand birth cohort followed into adulthood revealed that children with childhood-onset conduct problems showed more domestic violence, violence toward children, and convictions for violence than those with adolescent onset of their conduct problems (Odgers et al., 2008). Furthermore, those with childhoodonset conduct problems also showed higher rates of mental health problems, including anxiety, depression, and substance use, as well as more serious physical health problems, including higher rates of sexually transmitted diseases and serious injuries (Odgers et al., 2008).

More relevant to causal theory, however, are findings indicating that these two groups differ on a number of risk factors related to antisocial behavior. Specifically, most of the dispositional (e.g., neuropsychological abnormalities and low intelligence) and contextual (e.g., family dysfunction and poverty) correlates that have been associated with severe antisocial behavior appear to be associated primarily with the childhood-onset subtype (Frick & Viding, 2009; Moffitt, 2006). In contrast, youth with the adolescent-onset subtype do not consistently show these same risk factors. Members of this group primarily differ from children without conduct problems in that they show more affiliation with delinquent peers and score higher on measures of rebelliousness and authority conflict (Dandreaux & Frick, 2009; Moffitt & Caspi, 2001; Moffitt, Caspi, Dickson, Silva, & Stanton, 1996).

The different characteristics of children in the two subgroups of antisocial youth have led to theoretical models postulating very different causal mechanisms operating within the two groups. For example, Moffitt (2006) proposed that children in the childhood-onset group develop their problem behavior through a transactional process involving a difficult and vulnerable disposition (e.g., impulsive, verbal deficits, poor emotional regulation) coupled with an inadequate rearing environment (e.g., poor parental supervision and poor-quality schools). This dysfunctional transactional process disrupts the child's socialization, leading to poor social relations with persons both inside (e.g., parents and siblings) and outside the family (e.g., peers and teachers). These impaired relations lead to enduring vulnerabilities that can negatively affect the child's psychosocial adjustment across multiple developmental stages (see also Frick & Viding, 2009; Patterson, Reid, & Dishion, 1992).

In contrast with this mechanism, Moffitt (2006) proposed a very different causal model to

account for the subgroup of individuals who exhibit adolescent-onset conduct problems. Given that individuals of this type are more likely to have problems limited to adolescence, and show fewer dispositional and contextual risk factors, this group was conceptualized as reflecting an exaggeration of the normative process of adolescent rebellion (i.e., most adolescents show some level of rebelliousness to parents and other authority figures). This behavior is part of a process by which the adolescent begins to develop his or her autonomous sense of self and concept of unique identity. According to Moffitt, children in the adolescentonset group engage in antisocial and delinquent behaviors in a misguided attempt to attain a subjective sense of maturity and adult status in a way that is maladaptive (e.g., breaking societal norms) but encouraged by an antisocial peer group. Given that their behavior is viewed as an exaggeration of a process specific to adolescence, and not due to enduring vulnerabilities, their antisocial behavior is less likely to persist beyond adolescence. However, they may still have impairments that persist into adulthood due to the consequences of their adolescent antisocial behavior (e.g., a criminal record, dropping out of school, and substance abuse; Odgers et al., 2008).

It is important to note that the clear differences between the childhood-onset and adolescent-onset groups have not been found in all samples (Lahey et al., 2000) and the applicability of this conceptualization to girls requires further testing (Frick & Nigg, 2012). However, given the consistency of findings across samples, any model of the development of severe antisocial behavior, including those attempting to extend the construct of psychopathy to youth, must consider the childhood- and adolescent-onset distinction. Furthermore, members of the childhood-onset group show a number of characteristics that appear consistent with the construct of psychopathy, such as severe, chronic, and aggressive antisocial behavior that is likely to persist into adulthood. To date, three studies have directly tested for an association between age of onset of conduct problems and features associated with the construct of psychopathy. First, Moffitt and colleagues (1996) reported that boys with a preadolescent onset of their conduct problems who exhibited a continuous level of conduct problem behavior across development (i.e., life-course persistent) were more likely to display a personality style marked by cold and callous behavior toward others than were boys whose conduct problems started in adolescence. Second, in an adjudicated sample, Silverthorn, Frick, and Reynolds (2001) reported that boys who showed serious conduct problems prior to adolescence (prior to age 10) showed higher rates of psychopathic traits than boys whose antisocial behavior emerged after age 11. Third, Dandreaux and Frick (2009) studied 78 adolescent boys (ranging in age from 11 to 18) who had become involved in the juvenile justice system and found that those whose serious conduct problem behavior began in childhood (n = 47) showed higher rates of psychopathic traits than those with an onset in adolescence (n = 31).

Taken together, findings from these studies suggest a number of characteristics consistent with the construct of psychopathy in the childhood-onset group. However, this group also shows a number of features that are not consistent with psychopathy, such as verbal intelligence deficits, high levels of family dysfunction, and high levels of anxiety (Frick & Viding, 2009). Furthermore, not all children with early-onset conduct problems show a chronic pattern of antisocial deviance that extends into adulthood. For example, only 43% of a sample of boys with early-onset conduct problems reported engaging in severe violent behavior as an adult, and only 55% had a conviction in adult court by the age of 26 years (Moffit, Caspi, Harrington, & Milne, 2002). For these reasons, the childhoodonset category may be too broad to represent a developmental precursor to psychopathy, and further distinctions within this group may be needed to effectively delineate individuals of this type.

#### Comorbidity between CD and Attention-Deficit/Hyperactivity Disorder

Past research on conduct problems in children has consistently shown that these problems co-occur with a large number of other disorders and problems in adjustment (Frick, 2012). Furthermore, the presence of certain comorbid conditions has been a common criterion for designating important subgroups of youth with conduct problems. One of the most common overlapping disorders in children with conduct problems is attentiondeficit/hyperactivity disorder (ADHD), for which rates of diagnosis range from 36% in community samples (Waschbush, 2002) to as high as 90% in some clinic-referred samples of children with conduct problems (Abikoff & Klein, 1992). This overlap between conduct problems and ADHD seems to be particularly strong for children in the childhood-onset group (Frick & Viding, 2009).

There have been a number of reviews of the extensive body of research investigating the overlap between conduct problems and ADHD (Hinshaw, 1987; Lilienfeld & Waldman, 1990; Lynam, 1996; Newcorn & Halperin, 2000; Waschbusch, 2002). These reviews have documented a number of consistent differences between children with conduct problems and ADHD compared to those with conduct problems alone. First, research has consistently shown that youth with both conduct problems and ADHD show a more severe and aggressive pattern of antisocial behavior than youth with conduct problems alone (Lynam, 1996; Waschbusch, 2002). Second, children with ADHD and conduct problems have poorer outcomes than children with conduct problems alone, such as showing higher rates of police contact, delinquency, theft, and overall offending in adolescence (Loeber, Brinthaupt, & Green, 1990), as well as higher rates of arrests and convictions in adulthood (Babinski, Hartsough, & Lambert, 1999; Magnusson, 1987). Third, youth with comorbid ADHD and conduct problems also exhibit a number of distinct neuropsychological deficits. For example, antisocial youth with ADHD are more impaired on tasks measuring verbal and auditory memory (Moffitt & Silva, 1988), show greater deficits in verbal intelligence (Moffitt, 1990) and in executive functioning (Moffitt & Henry, 1989), and have more problems inhibiting a dominant response (Halperin, O'Brien, & Newcorn, 1990).

This evidence clearly suggests that the comorbidity of ADHD and conduct problems designates an important subgroup of antisocial and aggressive youth. However, there is considerable disagreement as to the best way to conceptualize this in causal theories. For example, it has been proposed that the symptoms of ADHD (or, more specifically, the impulsivity or hyperactivity symptoms) may be the primary causal factor leading to the development of serious conduct problems for many children with childhood-onset conduct problems (Burns & Walsh, 2002). Alternatively, it has been suggested that the comorbidity of ADHD and conduct problems represents an additive combination of two separate domains that, when combined, leads to a particularly severe and impairing pattern of behavior (Waschbusch, 2002). Finally, it has been proposed that the comorbidity of ADHD and conduct problems designates a distinct disorder that is qualitatively different from either disorder alone (Lynam, 1996).

This latter view is potentially important for developmental models of psychopathy because

Lynam (1996) proposed that the comorbidity of symptoms of ADHD and conduct problems may represent a disorder in children similar to psychopathy in adults. Lynam proposed that the combination of these behavioral problems arises from a "psychopathic deficit" that consists of difficulty incorporating feedback from the environment and using this information to modulate responses when pursuing rewards. This deficit purportedly leads to hyperactive, inattentive, and impulsive behaviors in early childhood that then develop into oppositional and defiant behaviors as the child acquires verbal and motor skills. In adolescence and adulthood, the psychopathic deficit can result in the manipulative and callous behaviors that are characteristic of adults who show psychopathic traits. In a test of this model, Lynam (1998) found that children with comorbid ADHD symptoms and conduct problems differed from other children with conduct problems by showing greater deficits on laboratory tasks assessing response modulation, delay of gratification, and executive functioning. These characteristics of children with comorbid conduct problems and ADHD are similar to those found for adults with psychopathic traits (Brinkley, Newman, Widiger, & Lynam, 2004).

This explanation for the comorbidity of ADHD and conduct problems as a developmental extension of psychopathy may explain why children with childhood-onset conduct problems, who are more likely to show comorbid ADHD (Moffitt et al., 1996), are also more likely to show the cold and callous features associated with psychopathy. Furthermore, this theory makes use of a great deal of existing research by embedding its model of developmental precursors to psychopathy within the existing diagnostic definitions of disruptive behavior disorders for youth (Burns, 2000). However, the focus on ADHD and conduct problems places primary emphasis on an impulsive-antisocial dimension of behavior that has not proven to be specific to adults with psychopathy; that is, impulsive-antisocial tendencies appear to be elevated in most adults with significant criminal histories and/or a diagnosis of antisocial personality disorder, and do not appear to be specific to persons with psychopathy (Skeem & Cooke, 2010).

What has been critical to adult definitions of psychopathy is the presence of a specific affective (e.g., lack of guilt or empathy) and interpersonal (e.g., using others for one's own gain and manipulating others) style that may accompany this impulsive and antisocial lifestyle (Hare, 2003). It is possible, as suggested by Lynam (1996), that the affective and interpersonal features emerge later in development and are secondary to the problems in inhibitory control. However, there is evidence that the affective components of conscience and inhibitory control represent separable dimensions even very early in development (Kochanska, 1995, 1997; Kochanska, Gross, Lin, & Nichols, 2002). Therefore, it is also possible that a specific focus on the affective and interpersonal features of the construct of psychopathy may provide even greater specificity for developmental models of psychopathy.

In support of this contention, Barry and colleagues (2000) divided clinic-referred children (ages 6-13) with both ADHD symptoms and a conduct problem diagnosis into those elevated and not elevated on a measure of callous-unemotional (CU) traits, which corresponds to the affective dimension of psychopathy. Only those children with elevated CU traits showed higher levels of thrillseeking behaviors and deficits in response modulation compared to a control group with ADHD alone or a group without behavior problems. Similarly, in a sample of nonreferred elementary-age schoolchildren, those with conduct problems and CU traits showed greater levels of aggression and self-reported delinquency (Frick, Cornell, Barry, Bodin, & Dane, 2003). The group with CU traits also showed higher rates of ADHD symptoms. However, the higher rates of aggression and delinquency could not be accounted for by the ADHD symptoms. In fact, those children high on CU traits and conduct problems but without significant ADHD symptoms showed the highest level of aggressive and delinquent behaviors.

#### Undersocialized and Socialized Subgroups of Antisocial Youth

The foregoing findings suggest that a specific focus on the affective dimension of psychopathy may be critical for developmental models of psychopathy. One of the earliest attempts to explicitly extend the construct of psychopathy to youth divided juvenile offenders into categories labeled "psychopathic" and "socialized" (Quay, 1964). The psychopathic group was characterized by traits such as lack of concern for others, untrustworthiness, lack of bonding with others, and destructive and assaultive behaviors. This group was contrasted with a socialized delinquent group that was less aggressive and less interpersonally alienated, and often committed nonaggressive delinquent acts (e.g., truancy, stealing, and drug use) with antisocial peers. In an attempt to avoid the pejorative connotations associated with the label "psychopathy," the name of the former subgroup was later changed to "undersocialized aggressive" (Quay, 1986).

A number of subsequent studies evaluated the validity and clinical utility of this subtyping approach, and findings from these studies were quite promising in terms of designating a group of antisocial youth who might represent a developmental precursor to psychopathy. Specifically, undersocialized aggressive youth showed more adjustment problems in juvenile facilities, were less successful in institutional work-release programs, and were more likely to violate probation and be rearrested than socialized aggressive youth (Quay, 1987). Furthermore, undersocialized aggressive youth were characterized by low autonomic arousal, diminished serotonergic functioning, response perseveration on laboratory tasks, and stimulation-seeking behaviors (Lahey, Hart, Pliszka, Applegate, & McBurnett, 1993; Quay, 1987, 1993; Raine, 2002). These results all paralleled findings for adults with psychopathy (Blair et al., 2005).

Because of these promising findings, DSM-III (APA, 1980) included in its diagnosis of CD a distinction between "socialized" and "undersocialized" subtypes. The key characteristics of the undersocialized subtype of CD highlight the overlap with definitions of psychopathy in adults. Specifically, the symptoms include characteristics such as lack of empathy, superficial peer relationships, egocentrism, absence of remorse, and willingness to inform on or blame companions.

Unfortunately, the change in name from "psychopathy" to "undersocialized–aggressive" resulted in considerable confusion as to the core features of this subtype and how best to operationalize these features (Hinshaw et al., 1993; Lahey, Loeber, Quay, Frick, & Grimm, 1992). Some definitions focused on the child's ability to form and maintain social relationships, whereas others focused primarily on the context (alone or as a group) in which the antisocial acts were typically committed. Very few definitions focused directly on the interpersonal and affective characteristics that were central to the clinical descriptions of psychopathic individuals on which this method of subtyping was purportedly based.

As a result of this definitional confusion, the next revision of the DSM (DSM-III-R; APA, 1987) changed the method for subtyping CD (Lahey et al., 1992). Specifically, the criteria for the undersocialized subtype were changed to focus solely on whether the antisocial acts were committed alone, and whether the pattern included aggressive symptoms. It was renamed the "solitary-aggressive" subtype. The criteria for the second subtype focused solely on whether the antisocial acts were committed with other antisocial peers, and this subtype was assumed to be primarily nonaggressive in nature. It was renamed the "group" subtype. The rationale for defining subtypes in this way was twofold. First, children of the undersocialized type tended to be highly aggressive, whereas most children identified as falling within the socialized type tended to show nonaggressive symptoms. Second, it was assumed that reliability of diagnosis would be enhanced because there was less ambiguity in measuring physical aggression and in determining who was typically present when a child engaged in antisocial behavior compared to measuring more subjective personality traits related to a child's empathic concern for others and feelings of guilt (Hinshaw et al., 1993; Lahey et al., 1992). This rationale, while eliminating some of the confusion inherent in assessing the earlier DSM-III criteria, moved this subtyping approach away from a focus on the interpersonal and affective features that are considered hallmarks of adult psychopathy to a greater focus on the type of antisocial behavior displayed by the child (see Hare, Hart, & Harpur, 1991, for a similar trend in definitions used to define psychopathy in adults).

# CU Traits and Developmental Pathways to Conduct Problems

#### Explicitly Extending the Construct of Psychopathy to Youth

Although DSM-III-R (and subsequently DSM-IV) moved away from an emphasis on interpersonal and affective features of psychopathy in the classification of CD, a number of researchers began testing other methods for extending the construct of psychopathy to youth. One approach involved focusing specifically on CU traits to designate a distinct subgroup of antisocial and aggressive youth, and seeking to develop reliable methods for assessing these traits. Within this approach, CU traits are considered synonymous with the affective subdimension of psychopathy, which include lack of guilt, deficient empathy, and general poverty of emotional reaction. The focus on this symptomatic dimension grew out of work investigating psychopathy in terms of the multifaceted conceptualization embodied in the Psychopathy Checklist—Revised (PCL-R; Hare, 2003), one of the most widely used methods for assessing psychopathic traits in adults. Specifically, research on this clinical measure of psychopathy has consistently uncovered separate affective (e.g., lack of guilt and empathy; poverty of emotion), interpersonal (e.g., grandiosity and manipulativeness), and unrestrained behavioral (e.g., impulsivity and irresponsibility) facets, in addition to antisocial acts (Hare & Neumann, 2008).

Direct attempts to extend items from the PCL-R downward for use with children and adolescents revealed parallel CU, narcissistic, and impulsive symptom dimensions across both boys and girls, across diverse settings (e.g., community, clinic-referred, and forensic samples; Caputo, Frick, & Brodsky, 1999; Christian, Frick, Hill, Tyler, & Frazer, 1997), and across different assessment formats (Frick, Bodin, & Barry, 2000; Jones, Cauffman, Miller, & Mulvey, 2006; Kosson et al., 2013; Vitacco, Rogers, & Neumann, 2003). Notably, the narcissistic and impulsive dimensions did not appear to differentiate important subgroups within severely antisocial youth. For example, a cluster analysis of psychopathic traits and conduct problems in a clinic-referred sample of children ages 6-13 revealed two distinct conduct problem clusters (Christian et al., 1997). These clusters did not differ in levels of impulsivity or narcissism, but they did differ in levels of CU traits, with the group high on CU traits showing more serious conduct problems. Similarly, in a sample of adjudicated adolescents, narcissistic and impulsive traits did not differentiate among nonviolent offenders, violent offenders, and violent sex offenders (Caputo et al., 1999), but the violent sex offender subgroup showed significantly higher levels of CU traits. Across both studies, children high on CU traits also tended to be high on the impulsive and narcissistic dimensions. Also evident in both study samples, however, were individuals with high levels of impulsive and narcissistic traits, but without CU traits (see Frick et al., 2000, for similar findings in a community sample).

Thus, while serious adolescent offenders and children with early-onset conduct problems show higher levels of the interpersonal (i.e., narcissistic) and behavioral (i.e., impulsive) features of psychopathy when compared to various types of control groups, these dimensions often fail to differentiate subgroups within samples of severely antisocial youth. Thus, for the prediction of the serious offending and early-onset serious conduct problems in general, it is not surprising that these facets of psychopathy show the strongest level of prediction in samples of adolescents (Edens, Campbell, & Weir, 2007; Leistico et al., 2008). However, CU traits seem to be more important for designating a distinct group *within* serious adolescent offenders and children with early-onset serious conduct problems. In addition, appreciable evidence has accumulated to indicate that this subgroup is both etiologically distinct (i.e., has unique causal factors leading to the behavior) and clinically important (i.e., shows more severe and impairing behavior problems).

#### The Importance of CU Traits for Defining Subgroups of Antisocial Youth

Based on a comprehensive review of findings from over 200 studies, Frick, Ray, Thornton, and Kahn (2014b) concluded that CU traits designate a subgroup of antisocial children and adolescents with distinct biological, cognitive, emotional, and social characteristics that (1) mirror characteristics shown by adults who score high on measures of psychopathy, and (2) distinguish groups that show unique causal processes leading to antisocial behavior. Additionally, some other points made by these authors appear particularly relevant for causal theories of antisocial behavior in youth. First, the relative contributions of genetic and environmental influences to serious early-onset conduct problems appear to differ for individuals high compared to low in CU traits. For example, in a large (N = 7,374) population-based study of 7-year-old twins, Viding, Blair, Moffitt, and Plomin (2005) reported that genetic influences on childhoodonset conduct problems were considerably greater for those high in CU traits (81%) than for those who showed normative levels of CU traits (30%). Complementing this finding, other work indicates that the association between harsh and coercive discipline and conduct problems is stronger among youth with normative levels of CU traits than among youth high in CU traits (Frick et al., 2014b). Second, consistent with research on psychopathy in adults, children with serious conduct problems accompanied by CU traits show abnormalities in processing of punishment cues. Specifically, children with conduct problems who are also elevated on CU traits show insensitivity to punishment cues on tasks in which a reward response set is primed and the child must recognize an increasing ratio of punished to rewarded responses (Frick, Cornell, Bodin, et al., 2003). Furthermore,

children with conduct problems and elevated CU traits respond poorly to gradual punishment schedules (Blair, Colledge, Murray, & Mitchell, 2001). These differences in responsiveness to punishment cues in antisocial youth with elevated CU traits are accompanied by differences in brain reactivity to punishment (Finger et al., 2012; White, Brislin, Meffert, Sinclair, & Blair, 2013). Third, children and adolescents with serious conduct problems and elevated CU traits show reduced reactivity to signs of fear and distress in others. This diminished emotional reactivity is evident in selfreport measures of physiological arousal (Marsh et al., 2011), cognitive tasks assessing attentional orienting to emotional pictures (Kimonis, Frick, Cauffman, Goldweber, & Skeem, 2012; Kimonis, Frick, Fazekas, & Loney, 2006), psychophysiological responses to emotionally evocative films (de Wied, van Boxtel, Matthys, & Meeus, 2012), and amygdala responses to fearful faces (Lozier, Cardinale, VanMeter, & Marsh, 2014; Viding et al., 2012). In contrast, children and adolescents with serious conduct problems but without elevated CU traits show enhanced emotional responsiveness to fear and distress in others, and this again is consistent across multiple levels of assessment (Kimonis et al., 2006; Viding et al., 2012).

In summary, it appears that the presence of CU traits designates a distinct group of antisocial children and adolescents showing a number of characteristics that suggest unique processes leading to antisocial behavior relative to those with normative levels of CU traits. In the next section, we describe a causal model for serious antisocial behavior that takes into account these differences. Aside from the issue of causality, presence versus absence of CU traits also has important clinical implications. For one thing, youth high in CU traits exhibit more severe antisocial tendencies. In a review of findings from 91 studies, Frick and colleagues (2014b) reported evidence of a moderatelevel association between CU traits and measures of antisocial behavior (mean r across studies = .33; range = -.15 to .84). More critically, they reviewed evidence suggesting that individuals high in CU traits represent a particularly severe subgroup within the category of children and adolescents exhibiting antisocial behavior. Specifically, research has indicated that in youth with childhood-onset conduct problems (Kahn, Frick, Youngstrom, Findling, & Youngstrom, 2012; Pardini et al., 2012) or adjudicated adolescents who show serious antisocial behavior (Kruh et al., 2005; Lawing et al., 2010), CU traits designate a particularly aggressive subgroup. As noted previously, their aggression results in more harm to others and is more likely to be instrumental (i.e., for personal gain or dominance) and premeditated compared to that of other children and adolescents with severe conduct problems (Frick, Cornell, Barry, et al., 2003; Kruh et al., 2005; Lawing et al., 2010). Furthermore, CU traits are associated with greater persistence of conduct problems across time (Frick, Stickle, Dandreaux, Farrell, & Kimonis, 2005; Rowe et al., 2010). Importantly, among children with conduct problems, those high in CU traits show elevated risk for antisocial outcomes in adulthood (e.g., arrests, diagnoses of antisocial personality disorder) compared to those low in CU traits, even when researchers control for severity and age of onset of conduct problems (McMahon, Witkiewitz, Kotler, & the Conduct Problems Prevention Research Group, 2010).

Such findings, combined with evidence for differing responses to treatment as a function of presence–absence of elevated CU traits (Frick et al., 2014b), led to the inclusion of a specifier for the diagnosis of CD in DSM-5 (APA, 2013) to differentiate cases with and without elevated levels of CU traits. The specifier "with limited prosocial emotions" is assigned if the individual (1) meets criteria for CD and (2) shows two or more of the following characteristics persistently over 12 months in more than one relationship or setting: lack of remorse or guilt; callous lack of empathy; lack of concern about performance at school, work, or in other important activities; and shallow or deficient affect.

Establishment of these four criteria to capture CU traits and the diagnostic cutoff to designate elevated levels of these traits was based on extensive analyses of data from large samples of youth across different countries (Kimonis et al., 2015). These analyses indicated that these four criteria consistently emerged as the best indicators of the overall CU trait construct across different types of samples using measures in different languages. Furthermore, the presence of two of the four specified symptoms, if exhibited persistently, designated a more severely impaired group of antisocial youth across samples (Kimonis et al., 2015). In addition, further support for the validity of this definition comes from a population-based study of children and adolescents (Rowe et al., 2010) which showed that youth with CD who qualified for the CU specifier were over five times more likely to exhibit continued serious conduct problems 3 years later than those not assigned the CU specifier. Additionally, other research with both clinic-referred and community samples has shown that children with CD who qualify for the CU specifier exhibit more aggressive and cruel behavior than those who do not (Kahn et al., 2012).

In summary, the presence of elevated CU traits appears to be useful for designating a clinically important subgroup of children and adolescents with serious conduct problems who show a number of distinct emotional, cognitive, and social characteristics. This body of work has served as an impetus for developing causal theories of serious conduct problems that recognize these important differences. These theories, described next, provide a framework for integrating research and theory on psychopathy with research on how conscience normally develops in young children, and are therefore useful for advancing developmental models of psychopathy.

#### **Developmental Models to Explain CU Traits**

The preference for novel and dangerous activities, the lack of emotional responsiveness to negative emotional material, and the lack of sensitivity to cues for punishment are all consistent with a temperamental style that has been variously labeled as "low fearfulness" (Rothbart & Bates, 1998), "low behavioral inhibition" (Kagan & Snidman, 1991), "low harm avoidance" (Cloninger, 1987), or "high daring" (Lahey & Waldman, 2003). Importantly, several studies of normally developing children have linked this temperamental style to lower scores on measures of conscience development in both concurrent (Asendorpf & Nunner-Winkler, 1992; Kochanska et al., 2002) and prospective studies (Rothbart, Ahadi, & Hershey, 1994). These findings have led to differing theories as to how this temperamental disposition may be involved in conscience development (for a more extended review, see Frick, Ray, Thornton & Kahn, 2014a).

For example, some theories suggest that moral socialization and the internalization of parental and societal norms are partly dependent on the negative arousal evoked by potential punishment for misbehavior (Fowles & Kochanska, 2000; Kagan, 1998; Kochanska, 1993). Guilt and anxiety associated with actual or anticipated wrongdoing may be impaired if a child has a temperament that results in reduced negative arousal to cues of punishment and a diminished experience of anxiety (Kagan, 1998; Kochanska, 1993). Blair and colleagues (2005; Blair, 1995) proposed a similar model of moral socialization that also emphasizes the importance of negative emotional arousal. However, this model focuses more specifically on the development of empathic concern in response to the distress in others. Blair and colleagues contend that a critical process in the development of empathic concern is the ability to encode emotional stimuli. This ability leads a child to respond to distress cues in others with increased autonomic activation, and this negative emotional response develops before the infant or toddler is cognitively able to take the perspective of others, such as when a young child becomes upset in response to the cries of another child. According to this model, these early negative emotional responses to the distress of others become conditioned to behaviors by the child that lead to distress in others. Through a process of conditioning, the child learns to inhibit such behaviors as a way to avoid this negative arousal. Fearless children may show problems in the encoding of emotional stimuli and, as a result, may not experience this negative arousal as strongly as other children, leading to problems in empathic concern and perspective taking.

Negative-arousal-based theories of conscience development have largely focused on adverse effects of arousal deficits on the emergence of empathy and guilt. Moul, Killcross, and Dadds (2012) proposed a theory of conscience development involving two interrelated cognitive processes, both associated with the function of the amygdala. The first process entails reflexive shifting of the child's gaze to the eye region in response to cues of fear and distress in others. This attention to the eye region is posited to be critical for the child's ability to recognize and respond to cues of fear and distress in others. The second process pertains to the relative balance within the child of (1) learning guided by attention to the general valence of the potential outcome (e.g., positive or negative outcomes) and (2) learning guided by attention to the specific value of an outcome (i.e., severity of the consequences). A learning style that is dominated by attention to the valence of an outcome and deficient in encoding of the relative value of the outcome can lead to a behavioral style that is motivated more by potential rewards, even when the behavior leads to serious negative consequences. This theoretical perspective can account for a number of characteristics that have been reported in children with CU traits, including deficient amgydala reactivity to fearful faces (Lozier et al., 2014; Viding et al., 2012), reduced attention to

the eye region when viewing faces of persons in distress (Dadds, El Masry, Wimalaweera, & Guastella, 2008), and reduced sensitivity to punishment during tasks requiring competing responses to rewards and punishment (Frick, Cornell, Bodin, et al., 2003).

In summary, a number of theories have been proposed to explain how the emotional characteristics of children with CU traits may impact conscience development. However, it is also clear from past research that not all children with a fearless and uninhibited temperament show deficits in empathy and guilt. As a result, most theories of conscience development also consider the role of parenting and, more specifically, how parenting may interact with the child's temperament in conscience development. For example, Kochanska (1997; Kochanska & Murray, 2000) proposed that the emotional quality of the relationship between parent and child may be especially important for conscience development in fearless children. This aspect of parenting does not rely on punishmentrelated arousal for socialization, but rather focuses on the positive qualities (e.g., parental warmth) of the parent-child relationship. In support of this proposal, attachment security was shown to be predictive of conscience development in temperamentally fearless children (Kochanska, 1995, 1997). Also, consistent with this theory are findings indicating that whereas harsh, inconsistent, and coercive discipline has consistently been shown to be more highly associated with conduct problems in youth with normative levels of CU traits, low warmth in parenting appears to be more strongly associated with conduct problems in youth with elevated CU traits (Kroneman, Hipwell, Loeber, Koot, & Pardini, 2011; Pasalich, Dadds, Hawes, & Brennan, 2012).

As another example of how temperament and parenting may interact in predicting conscience development, Cornell and Frick (2007) proposed that behaviorally inhibited children, because they are temperamentally predisposed to develop appropriate levels of guilt, often do so even with less than optimal parenting. However, fearless and behaviorally uninhibited children require stronger and more consistent parenting to develop appropriate levels of guilt. Cornell and Frick tested this possibility in a sample of preschool children (ages 3-5) nominated by their teachers as being highly behaviorally inhibited or highly uninhibited. Consistent with prediction, behaviorally inhibited children showed higher levels of guilt, irrespective of the consistency of parenting. However, uninhibited children showed higher levels of guilt only when parental consistency was high. Similarly, authoritarian parenting (i.e., use of strong rules- and obedience-oriented parenting) was unrelated to a measure of guilt in behaviorally inhibited children but positively related to levels of guilt in uninhibited children.

Thus, the presence of elevated CU traits distinguishes a subgroup of youth with conduct problems who seem to show a unique causal pathway for behavior problems that likely involve problems in the normal development of conscience. Importantly, separating out this unique causal pathway to antisocial behavior may help to clarify causal factors involved in the development of serious conduct problems in children with normative levels of CU traits (Frick et al., 2014b; Frick & Viding, 2009). Specifically, children with CU traits represent only one subgroup of children with serious conduct problems that arise prior to adolescence. In fact, those with significant levels of CU traits appear to comprise only a minority of children in the childhood-onset group (Kahn et al., 2012; Pardini et al., 2012; Rowe et al., 2010). Furthermore, children with severe conduct problems but normative levels of CU traits do not show problems in empathy and guilt; in fact, they often show high levels of emotional reactivity, such as anxiety and anger, and they appear highly distressed by the effects of their behavior on others (Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999; Pardini, Lochman, & Frick, 2003). Additionally, this group does not appear to show the deficits in sensitivity to cues of punishment displayed by children with elevated CU traits (Barry et al., 2000). Thus, the antisocial behavior in this group with normative levels of CU traits could not be adequately explained by a temperament characterized by a lack of fearful inhibitions and insensitivity to punishment leading to deficits in conscience development. In addition, research findings reviewed by Frick and colleagues (2014b) suggest that conduct problems in this group are less determined by genetic influences and more highly related to hostile and inconsistent parenting practices. Furthermore, children with conduct problems who show normative levels of CU traits are more likely to show deficits in verbal intelligence and hostile attribution biases compared to children with conduct problems and elevated levels of CU traits (Frick et al., 2014b).

Such findings led Frick and Viding (2009) to postulate that the severe conduct problems of children with normative levels of CU traits reflect problems in the regulation of emotion and behavior. Specifically, deficits in verbal abilities or other cognitive processes, combined with inadequate socializing experiences, may result in problems in the child's ability to anticipate negative consequences of behavior or his or her ability to delay gratification. Furthermore, strong reactivity to negative stimuli and provocation, again combined with inadequate socializing experiences, may lead to the child committing impulsive and unplanned aggressive and antisocial acts in the context of high emotional arousal (e.g., anger), for which he or she appears remorseful afterward but still has difficulty controlling in the future.

#### Critical Issues and Future Directions in Research on CU Traits

Empirical findings to date provide substantial support for the utility of CU traits in research directed at understanding developmental precursors to psychopathy and in diagnostic classification systems designed to distinguish among variants of CD with differing causal pathways. The importance of the CU traits to clinical decision making is evidenced by their inclusion in the "with limited prosocial emotions" specifier to the diagnostic criteria for CD in DSM-5. However, there are also a number of limitations in this body of research that should be addressed in future work in order to advance the utility of this framework for understanding and treating serious behavior problems in children and adolescents. Two of these directions, pertaining to variables that can influence the stability of CU traits at differing stages in development and how consideration of these variables can improve existing treatments for children and adolescents with CU traits, are addressed by Viding and Kimonis (Chapter 7, this volume). In what follows, we outline some additional important areas for future research.

First, more research is needed to identify the most effective indicators of CU traits. Specifically, CU traits have often been assessed as part of the broader construct of psychopathy and, as a result, existing measures tend to contain only a few items specifically assessing CU traits (Forth, Kosson, & Hare, 2003; Frick & Hare, 2001). Recently, a more extended measure of CU traits has been developed and tested in samples of children of widely varying ages from various countries, using differing language translations (Essau, Sasagawa, & Frick, 2006; Ezpeleta, de la Osa, Granero, Penelo, & Domenech, 2013; Fanti, Frick, & Georgiou, 2009; Kimonis et al., 2008; Roose, Bijttebier, Decoene, Claes, & Frick, 2010). Across these different samples, factor analyses have consistently indicated that the structure of CU traits is best represented by a model specifying an overarching CU dimension and three subfactors labeled "callous" (e.g., not caring about the feelings of others), "uncaring" (e.g., does not feel bad or guilty when he or she does something wrong), and "unemotional" (e.g., does not express feelings openly) traits (see Feilhauer, Cima, & Arntz, 2012, for an alternative factor structure). Although the ability to replicate this structure across samples and languages is promising, more work is needed to evaluate the theoretical and practical importance of the CU subfactors (Kimonis et al., 2008) and determine if other ways of operationalizing these traits show a similar structure (Latzman, Lilienfeld, Latzman, & Clark, 2013).

Second, it is also critical that research be devoted to establishing optimal methods for assessing CU traits as represented in the DSM-5's "limited prosocial emotions" specifier, which entails consideration of types of information other than assessments of the symptoms of CD. Specifically, to assess for symptoms of CD, the assessor needs to determine whether designated behaviors (e.g., fighting, stealing, lying) have occurred one or more times over a specific time frame (e.g., past 6 or 12 months). In contrast, assessing the indicators of the "with limited prosocial emotions" specifier requires consideration of whether relevant tendencies are evident "persistently over at least 12 months and in multiple relationships and settings" (p. 470; APA, 2013). This makes it critical to obtain information from multiple sources that can aid in determining whether the target characteristics are typical of the child's or adolescent's interpersonal and emotional functioning, or whether they occur only occasionally in certain situations. Given the importance of obtaining information from multiple sources, it will be crucial for research to evaluate alternative methods for collecting and integrating data across sources that can guide clinical practice, as has been done for other forms of psychopathology (De Los Reyes et al., 2011).

A third important priority for future research is to investigate whether CU traits provide important diagnostic information even in the absence of severe conduct problems (Rutter, 2012). Although high levels of CU traits are rarely seen in the absence of conduct problems in large representative community samples (Fontaine, McCrory, Boivin, Moffitt, & Viding, 2011), this may not be the case in samples with high rates of early trauma and deprivation (Kumsta, Sonuga-Barke, & Rutter, 2012). Furthermore, Moran, Ford, Butler, and Goodman (2008) reported results from a large (N = 5,770), nationally representative sample of children and adolescents (ages 5-16) indicating that CU traits predicted behavioral and emotional problems 12 and 24 months later, even in the absence of significant levels of CD symptoms. In other work, Musser, Galloway-Long, Frick, and Nigg (2013) reported that children meeting criteria for ADHD in the absence of CD showed different patterns of autonomic responding (both sympathetic and parasympathetic) to emotional stimuli depending on the presence of CU traits, and this difference remained even after they controlled for levels of conduct problems. Thus, there is some promising evidence that elevated levels of CU traits are associated with clinical impairment and distinct patterns of emotional responding, even in the absence of significant conduct problems.

Fourth, with the inclusion of a diagnostic label related to CU traits in DSM-5, it will be important for researchers to consider ways to minimize potential harmful consequences associated with this label. Although there is minimal evidence for the stigmatizing effects of many diagnostic labels, this is not true for diagnostic labels associated with antisocial behavior. Specifically, research has consistently demonstrated that antisocial labels (e.g., CD, psychopathic disorder) lead to more negative perceptions of treatment amenability for youth in the juvenile justice system compared to descriptions providing no mental disorder label (Jones & Cauffman, 2008; Rockett, Murrie, & Boccaccini, 2007; Vidal & Skeem, 2007). However, this effect appears to be more related to the antisocial behavior itself and not to a specific diagnostic label per se. For example, the diagnosis of CD is viewed just as negatively by persons in the mental health and juvenile justice systems (e.g., jurors, clinicians, judges, parole officers) as the label "psychopathic" (Boccaccini, Murrie, Clark, & Cornell, 2008; Murrie, Boccaccini, McCoy, & Cornell, 2007). In addition, using colloquial terms such as "a psychopath" or simply describing antisocial behaviors in young individuals can lead to even more negative views of risk for reoffending and treatment amenability than diagnostic labels of "conduct disorder" or "psychopathic disorder" (Boccaccini et al., 2008; Murrie et al., 2007).

Thus, empirical evidence suggests that providing descriptions of someone acting in a callous or unemotional manner may have more adverse effects than a label assigned as part of an official diagnosis. Along this line, Boccaccini and colleagues (2008) reported on a study of 891 potential jury pool members that compared the effects of descriptions of antisocial behavior with those of diagnostic (i.e., "conduct disorder," "psychopathic disorder") and colloquial (i.e., "is a psychopath") labels assigned in a psychological evaluation. As in past studies, effects on potential jurors' estimation of potential risk for future crime and ratings of whether the youth deserved greater punishment were evident. However, consistent with past research, effects were greatest for descriptions of antisocial behavior and use of the colloquial term "psychopath." Furthermore, there was no difference in the estimated risk for future crime between vignettes that employed the diagnostic terms "conduct disorder" or "psychopathic disorder." Importantly, use of diagnostic terms, either "conduct disorder" or "psychopathic disorder," led to more recommendations for mental health treatment for the hypothetical juvenile offenders.

In summary, available research indicates that diagnostic labels based on a person's display of antisocial behavior have the potential to influence others' perceptions of the person both negatively (e.g., risk for future problems) and positively (e.g., need for treatment). Thus, it is important to seriously consider how to balance these potential effects in both research and practice. Furthermore, as noted previously, past attempts to minimize negative labeling effects through use of the term "undersocialized" did not necessary reduce potential stigma and resulted in confusion as to how the construct should be assessed. As a result, this label did not aid in research or in conveying treatment needs. Moreover, there is a danger in using terms that seem to connote a less severe disturbance (e.g., with uncaring features) in an effort to decrease the potential for stigmatization because such definitions could lead children and adolescents with less severe disturbances or even with levels of these traits within a more normative range to be labeled with a disorder.

Based on these considerations, the use of the term "with limited prosocial emotions" in DSM-5 seems appropriate for maintaining diagnostic clarity and reducing potential harmful effects of labeling. It avoids the label "psychopathic," which seems to have the most pejorative connotation among antisocial labels. It also appears less pejorative than the term "callous–unemotional traits," although there are no data yet to support this contention. A potential concern with use of the specifier label instead of the term "callous-unemotional traits," which has been used most frequently in research, is that it could result in confusion as to whether the specifier is intended to capture the same construct. However, the text of DSM-5 (APA, 2013; see p. 471) explicitly states that the diagnostic indicators for this specifier are the behaviors used to define the CU traits construct in the research literature. Furthermore, "prosocial emotions" is a term often used to describe the emotions of guilt and empathy (Thompson & Newton, 2010), and limitations in their expression are central to the construct of CU traits (Kimonis et al., 2015). On balance, therefore, the DSM-5 label appears reasonable as a referent for the CU traits construct that has proven valuable for designating a clinically important subgroup of youth with serious conduct problems, and likely will prove useful for guiding future research and treatment on this construct, while still attempting to minimize potentially harmful effects of labeling.

#### REFERENCES

- Abikoff, H., & Klein, R. G. (1992). Attention-deficit hyperactivity and conduct disorder: Co-morbidity and implications for treatment. *Journal of Consulting and Clinical Psychology*, 60, 881–892.
- American Psychiatric Association. (1980). Diagnostic and statistical manual of mental disorders (3rd ed.). Washington, DC: Author.
- American Psychiatric Association. (1987). Diagnostic and statistical manual of mental disorders (3rd ed., rev.). Washington, DC: Author.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: Author.
- Asendorpf, J. B., & Nunner-Winkler, G. (1992). Children's moral motive strength and temperamental inhibition reduce their egoistic behavior in real moral conflicts. Child Development, 63, 1223–1235.
- Babinski, L. M., Hartsough, C. S., & Lambert, N. M. (1999). Childhood conduct problems, hyperactivity–impulsivity, and inattention as predictors of adult criminal activity. *Journal of Child Psychology and Psychiatry*, 40, 347–355.
- Barry, C. T., Frick, P. J., DeShazo, T. M., McCoy, M. G., Ellis, M., & Loney, B. R. (2000). The importance of callous–unemotional traits for extending the concept of psychopathy to children. *Journal of Abnormal Psychology*, 109, 335–340.
- Berkowitz, L. (1993). Aggression: Its causes, consequences, and control. New York: Academic Press.
- Björkqvist, K., Lagerspetz, K. M. J., & Kaukiainen, A. (1992). Do girls manipulate and boys fight?: Develop-

mental trends in regard to direct and indirect aggression. Aggressive Behavior, 18, 117–127.

- Blair, R. J. R. (1995). A cognitive developmental approach to morality: Investigating the psychopath. *Cognition*, 57, 1–29.
- Blair, R. J. R., Colledge, E., Murray, L., & Mitchell, D. G. V. (2001). A selective impairment in the processing of sad and fearful expressions in children with psychopathic tendencies. *Journal of Abnormal Child Psychology*, 29, 491–498.
- Blair, R. J. R., Mitchell, D., & Blair, K. (2005). The psychopath: Emotion and the brain. Malden, MA: Blackwell.
- Boccaccini, M. T., Murrie, D. C., Clark, J. W., & Cornell, D. G. (2008). Describing, diagnosing, and naming psychopathy: How do youth psychopathy labels influence jurors? *Behavioral Sciences and the Law*, 26, 487–510.
- Brinkley, C. A., Newman, J. P., Widiger, T. A., & Lynam, D. R. (2004). Two approaches to parsing the heterogeneity of psychopathy. *Clinical Psychology: Research* and Practices, 11, 69–94.
- Burns, G. L. (2000). Problem of item overlap between the Psychopathy Screening Device and attention deficit hyperactivity disorder, oppositional defiant disorder, and conduct disorder rating scales. *Psychological Assessment*, 12, 447–450.
- Burns, G. L., & Walsh, J. A. (2002). The influence of ADHD-hyperactivity/impulsivity symptoms on the development of oppositional defiant disorder symptoms in a 2-year longitudinal study. *Journal of Abnor*mal Child Psychology, 30, 245–256.
- Caputo, A. A., Frick, P. J., & Brodsky, S. L. (1999). Family violence and juvenile sex offending: Potential mediating roles of psychopathic traits and negative attitudes toward women. Criminal Justice and Behavior, 26, 338–356.
- Card, N. A., & Little, T. D. (2006). Proactive and reactive aggression in childhood and adolescence: A meta-analysis of differential relations with psychosocial adjustment. International Journal of Behavioral Development, 30, 466–480.
- Card, N. A., Stucky, B. D., Sawalani, G. M., & Little, T. D. (2008). Direct and indirect aggression during childhood and adolescence: A meta-analytic review of gender differences, intercorrelations, and relations to maladjustment. *Child Development*, 79, 1185–1229.
- Christian, R., Frick, P. J., Hill, N., Tyler, L. A., & Frazer, D. (1997). Psychopathy and conduct problems in children: II. Subtyping children with conduct problems based on their interpersonal and affective style. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 233–241.
- Cloninger, C. R. (1987). A systematic method for clinical description and classification of personality variants. Archives of General Psychiatry, 44, 573–588.
- Coie, J. D., & Dodge, K. A. (1998). Aggression and antisocial behavior. In W. Damon & N. Eisenberg (Eds.), Handbook of child psychology: Social, emotional, and

personality development (pp. 779–862). Toronto: Wiley.

- Cornell, A. H., & Frick, P. J. (2007). The moderating effects of parenting styles in the association between behavioral inhibition and parent-reported guilt and empathy in preschool children. *Journal of Clinical Child and Adolescent Psychology*, 36, 305–318.
- Cornell, D. G., Warren, J., Hawk, G., Stafford, E., Oram, G., & Pine, D. (1996). Psychopathy in instrumental and reactive violent offenders. *Journal of Consulting* and Clinical Psychology, 64, 783–790.
- Crapanzano, A. M., Frick, P. J., & Terranova, A. M. (2010). Patterns of physical and relational aggression in a school-based sample of boys and girls. *Journal of Abnormal Child Psychology*, 38, 433–445.
- Crick, N. R. (1996). The role of overt aggression, relational aggression, and prosocial behavior in the prediction of children's future social adjustment. *Child Development*, 67, 2317–2327.
- Crick, N. R., & Dodge, K. A. (1996). Social information-processing mechanisms in reactive and proactive aggression. Child Development, 67, 993–1002.
- Crick, N. R., & Grotpeter, J. K. (1995). Relational aggression, gender, and social-psychological adjustment. Child Development, 66, 710–722.
- Crick, N. R., Werner, N. E., Casas, J. F., O'Brien, K. M., Nelson, D. A., Grotpeter, J. K., et al. (1999). Childhood aggression and gender: A new look at an old problem. In D. Bernstein (Ed.), *The 45th Nebraska Symposium on Motivation: Gender and motivation* (pp. 75–141). Lincoln: University of Nebraska Press.
- Dadds, M. R., El Masry, Y., Wimalaweera, S., & Guastella, A. J. (2008). Reduced eye-gaze explains "fear blindness" in childhood psychopathic traits. *Journal* of the American Academy of Child and Adolescent Psychiatry, 47, 455–463.
- Dandreaux, D. M., & Frick, P. J. (2009). Developmental pathways to conduct problems: A further test of the childhood and adolescent-onset distinction. *Journal* of Abnormal Child Psychology, 37, 375–385.
- De Los Reyes, A., Youngstrom, E. A., Pabon, S. C., Youngstrom, J. K., Feeny, N. C., & Findling, R. L. (2011). Internal consistency and associated characteristics of informant discrepancies in clinic referred youths age 11 to 17 years. *Journal of Clinical Child and Adolescent Psychology*, 40, 36–53.
- de Wied, M., van Boxtel, A., Matthys, W., & Meeus, W. (2012). Verbal, facial and autonomic responses to empathy-eliciting film clips by disruptive male adolescents with high versus low callous–unemotional traits. Journal of Abnormal Child Psychology, 40, 211–223.
- Dodge, K. A., & Coie, J. D. (1987). Social-informationprocessing factors in reactive and proactive aggression in children's peer groups. *Journal of Personality* and Social Psychology, 53, 1146–1158.
- Dodge, K. A., Lochman, J. E., Harnish, J. D., Bates, J. E., & Pettit, G. S. (1997). Reactive and proactive aggression in school children and psychiatrically impaired

chronically assaultive youth. Journal of Abnormal Psychology, 106, 37–51.

- Edens, J. F., Campbell, J. S., & Weir, J. M. (2007). Youth psychopathy and criminal recidivism: A meta-analysis of the psychopathy checklist measures. *Law and Human Behavior*, 31, 53–75.
- Essau, C. A., Sasagawa, S., & Frick, P. J. (2006). Callous–unemotional traits in a community sample of adolescents. Assessment, 20, 454–469.
- Ezpeleta, L., de la Osa, N., Granero, R., Penelo, E., & Domenech, J. M. (2013). Inventory of callous–unemotional traits in a community sample of preschoolers. *Journal of Clinical Child and Adolescent Psychol*ogy, 42, 91–105.
- Fanti, K. A., Frick, P. J., & Georgiou, S. (2009). Linking callous–unemotional traits to instrumental and non-instrumental forms of aggression. *Journal of Psychopathology and Behavioral Assessment*, 31, 285–298.
- Farrington, D. P., Ohlin, L., & Wilson, J. Q. (1986). Understanding and controlling crime. New York: Springer-Verlag.
- Feilhauer, J., Cima, M., & Arntz, A. (2012). Assessing callous–unemotional traits across different groups of youths: Further cross-cultural validation of the Inventory of Callous–Unemotional Traits. International Journal of Law and Psychiatry, 35, 251–262.
- Finger, E. C., Marsh, A., Blair, K. S., Majestic, C., Evangelou, I., Gupta, K., et al. (2012). Impaired functional but preserved structural connectivity in limbic white matter tracts in youth with conduct disorder or oppositional defiant disorder plus psychopathic traits. *Psychiatry Research: Neuroimaging*, 202, 239–244.
- Fontaine, N., McCrory, E. J. P., Boivin, M., Moffitt, T. E., & Viding, E. (2011). Predictors and outcomes of joint trajectories of callous–unemotional traits and conduct problems in childhood. *Journal of Abnormal Psychology*, 120, 730–742.
- Forth, A. E., Kosson, D. S., & Hare, R. D. (2003). The Psychopathy Checklist: Youth Version manual. Toronto: Multi-Health Systems.
- Fowles, D. C., & Kochanska, G. (2000). Temperament as a moderator of pathways to conscience in children: The contribution of electrodermal activity. *Psychophysiology*, 37, 788–795.
- Frick, P. J. (2012). Developmental pathways to conduct disorder: Implications for future directions in research, assessment, and treatment. *Journal of Clinical Child and Adolescent Psychology*, 41, 378–389.
- Frick, P. J., Bodin, S. D., & Barry, C. T. (2000). Psychopathic traits and conduct problems in community and clinic-referred samples of children: Further development of the Psychopathy Screening Device. *Psychological Assessment*, 12, 382–393.
- Frick, P. J., Cornell, A. H., Barry, C. T., Bodin, S. D., & Dane, H. A. (2003). Callous–unemotional traits and conduct problems in the prediction of conduct problem severity, aggression, and self-report of delinquency. *Journal of Abnormal Child Psychology*, 31, 457–470.

- Frick, P. J., Cornell, A. H., Bodin, S. D., Dane, H. A., Barry, C. T., & Loney, B. R. (2003). Callous–unemotional traits and developmental pathways to severe conduct problems. *Developmental Psychology*, 39, 246–260.
- Frick, P. J., & Hare, R. D. (2001). The Antisocial Process Screening Device. Toronto: Multi-Health Systems.
- Frick, P. J., Lilienfeld, S. O., Ellis, M. L., Loney, B. R., & Silverthorn, P. (1999). The association between anxiety and psychopathy dimensions in children. *Journal* of Abnormal Child Psychology, 27, 381–390.
- Frick, P. J., & Nigg, J. T. (2012). Current issues in the diagnosis of attention deficit hyperactivity disorder, oppositional defiant disorder, and conduct disorder. *Annual Review of Clinical Psychology*, 8, 77–107.
- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014a). Annual research review: A developmental psychopathological approach to understanding callous–unemotional traits in children and adolescents with conduct problems. *Journal of Child Psychology* and Psychiatry, 55, 532–548.
- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014b). Can callous–unemotional traits enhance the understanding, diagnosis, and treatment of serious conduct problems in children and adolescents?: A comprehensive review. *Psychological Bulletin*, 140, 1–57.
- Frick, P. J., Stickle, T. R., Dandreaux, D. M., Farrell, J. M., & Kimonis, E. R. (2005). Callous–unemotional traits in predicting the severity and stability of conduct problems and delinquency. *Journal of Abnormal Child Psychology*, 33, 471–487.
- Frick, P. J., & Viding, E. M. (2009). Antisocial behavior from a developmental psychopathology perspective. *Development and Psychopathology*, 21, 1111–1131.
- Halperin, J. M., O'Brien, J. D., & Newcorn, J. H. (1990). Validation of hyperactive, aggressive, and mixed hyperactive/aggressive childhood disorders: A research note. *Journal of Child Psychology and Psychiatry*, 81, 455–459.
- Hare, R. D. (2003). Hare Psychopathy Checklist—Revised (PCL-R): Second edition, technical manual. Toronto: Multi-Health Systems.
- Hare, R. D., Hart, S. D., & Harpur, T. J. (1991). Psychopathy and the DSM-IV criteria for antisocial personality disorder. *Journal of Abnormal Psychology*, 100, 391–398.
- Hare, R. D., McPherson, L. M., & Forth, A. E. (1988). Male psychopaths and their criminal careers. *Journal* of Consulting and Clinical Psychology, 56, 710–714.
- Hare, R. D., & Neumann, C. S. (2008). Psychopath as a clinical and empirical construct. Annual Review of Clinical Psychology, 4, 217–246.
- Hinshaw, S. P. (1987). On the distinction between attentional deficits/hyperactivity and conduct problems/aggression in child psychopathology. *Psychological Bulletin*, 101, 443–463.
- Hinshaw, S. P., Lahey, B. B., & Hart, E. L. (1993). Issues of taxonomy and co-morbidity in the development of

conduct disorder. Development and Psychopathology, 5, 31–50.

- Huesmann, L. R., Eron, L. D., Lefkowitz, M. M., & Walder, L. O. (1984). Stability of aggression over time and generations. *Developmental Psychology*, 20, 1120–1134.
- Jones, S., & Cauffman, E. (2008). Juvenile psychopathy and judicial decision making: An empirical analysis of an ethical dilemma. *Behavioral Sciences and the Law*, 26, 151–165.
- Jones, S., Cauffman, E., Miller, J. D., & Mulvey, E. (2006). Investigating different factor structures of the Psychopathy Checklist: Youth Version: Confirmatory factor analytic findings. *Psychological Assessment*, 18, 33–48.
- Kagan, J. (1998). Biology and the child. In N. Eisenberg (Ed.) & W. Damon (Series Ed.), Handbook of child psychology: Vol. 3. Social, emotional, and personality development (pp. 177–235). New York: Wiley.
- Kagan, J., & Snidman, N. (1991). Temperamental factors in human development. American Psychologist, 46, 856–862.
- Kahn, R. E., Frick, P. J., Youngstrom, E., Findling, R. L., & Youngstrom, J. K. (2012). The effects of including a callous–unemotional specifier for the diagnosis of conduct disorder. *Journal of Child Psychology and Psychiatry*, 53, 271–282.
- Kimonis, E. R., Fanti, K. A., Frick, P. J., Moffitt, T. E., Essau, C., Bijjtebier, P., et al. (2015). Using self-reported callous–unemotional traits to cross-nationally assess the DSM-5 "With Limited Prosocial Emotions" specifier. Journal of Child Psychology and Psychiatry, 56, 1249–1261.
- Kimonis, E. R., Frick, P. J., Cauffman, E., Goldweber, A., & Skeem, J. (2012). Primary and secondary variants of juvenile psychopathy differ in emotional processing. Development and Psychopathology, 24, 1091–1103.
- Kimonis, E. R., Frick, P. J., Fazekas, H., & Loney, B. R. (2006). Psychopathy, aggression, and the emotional processing of emotional stimuli in non-referred girls and boys. *Behavioral Sciences and the Law*, 24, 21–37.
- Kimonis, E. R., Frick, P. J., Skeem, J., Marsee, M. A., Cruise, K., Muñoz, L. C., et al. (2008). Assessing callous–unemotional traits in adolescent offenders: Validation of the Inventory of Callous–Unemotional Traits. Journal of the International Association of Psychiatry and Law, 31, 241–252.
- Kochanska, G. (1993). Toward a synthesis of parental socialization and child temperament in early development of conscience. *Child Development*, 64, 325– 347.
- Kochanska, G. (1995). Children's temperament, mothers' discipline, and security of attachment: Multiple pathways to emerging internalization. *Child Development*, 66, 597–615.
- Kochanska, G. (1997). Multiple pathways to conscience for children with different temperaments: From toddlerhood to age 5. Developmental Psychology, 33, 228–240.

- Kochanska, G., Gross, J. N., Lin, M. H., & Nichols, K. E. (2002). Guilt in young children: Development, determinants, and relations with a broader system of standards. *Child Development*, 73, 461–482.
- Kochanska, G., & Murray, K. T. (2000). Mother–child mutually responsive orientation and conscience development: From toddler to early school age. *Child Development*, 71, 417–431.
- Kosson, D. S., Neumann, C. S., Forth, A. E., Salekin, R. T., Hare, R. D., Krischer, M. K., et al. (2013). Factor structure of the Hare Psychopathy Checklist: Youth Version (PCL:YV) in adolescent females. *Psychological Assessment*, 25, 71–83.
- Kroneman, L. M., Hipwell, A. E., Loeber, R., Koot, H. M., & Pardini, D. A. (2011). Contextual risk factors as predictors of disruptive behavior disorder trajectories in girls: The moderating effect of callous–unemotional features. *Journal of Child and Adolescent Psycyhology and Psychiatry*, 52, 167–175.
- Kruh, I. P., Frick, P. J., & Clements, C. B. (2005). Historical and personality correlates to the violence patterns of juveniles tried as adults. *Criminal Justice and Behavior*, 32, 69–96.
- Kumsta, R., Sonuga-Barke, E., & Rutter, M. (2012). Adolescent callous–unemotional traits and conduct disorder in adoptees exposed to severe early deprivation. British Journal of Psychiatry, 200, 197–201.
- Lagerspetz, K. M. J., Björkqvist, K., & Peltonen, T. (1988). Is indirect aggression typical of females?: Gender differences in aggressiveness in 11- to 12-yearold children. Aggressive Behavior, 14, 403–414.
- Lahey, B. B., Hart, E. L., Pliszka, S., Applegate, B., & McBurnett, K. (1993). Neurophysiological correlates of conduct disorder: A rationale and a review of research. *Journal of Clinical Child Psychology*, 22, 141–153.
- Lahey, B. B., & Loeber, R. (1994). Framework for a developmental model of oppositional defiant disorder and conduct disorder. In D. K. Routh (Ed.), *Disruptive behavior disorders in childhood* (pp. 139–180). New York: Plenum Press.
- Lahey, B. B., Loeber, R., Quay, H. C., Frick, P. J., & Grimm, J. (1992). Oppositional defiant disorder and conduct disorders: Issues to be resolved for DSM-IV. *Journal of the American Academy of Child and Adolescent Psychiatry*, 31, 539–546.
- Lahey, B. B., Schwab-Stone, M., Goodman, S. H., Waldman, I. D., Canino, G., Rathouz, P. J., et al. (2000). Age and gender differences in oppositional behavior and conduct problems: A cross-sectional household study of middle childhood and adolescence. *Journal* of Abnormal Psychology, 109, 488–503.
- Lahey, B. B., & Waldman, I. D. (2003). A developmental propensity model of the origins of conduct problems during childhood and adolescence. In B. B. Lahey, T. E. Moffitt, & A. Caspi (Eds.), Causes of conduct disorder and juvenile delinquency (pp. 76–117). New York: Guilford Press.
- Latzman, R. D., Lilienfeld, S. O., Latzman, N. E., &

Clark, L. A. (2013). Exploring callous and unemotional traits in youth via general personality traits: An eye toward DSM-5. *Personality Disorders: Theory, Treatment, and Research,* 4, 191–202.

- Lawing, K., Frick, P. J., & Cruise, K. R. (2010). Differences in offending patterns between adolescent sex offenders high or low in callous-unemotional traits. *Psychological Assessment*, 22, 298–305.
- Leistico, A. R., Salekin, R. T., DeCoster, J., & Rogers, R. (2008). A large-scale meta-analysis relating the Hare measures of psychopathy to antisocial conduct. *Law* and Human Behavior, 32, 28–45.
- Lilienfeld, S. O., & Waldman, I. D. (1990). The relation between childhood attention-deficit disorder and adult antisocial behavior reexamined: The problem of heterogeneity. *Clinical Psychology Review*, 10, 699–725.
- Loeber, R., Brinthaupt, V. P., & Green, S. M. (1990). Attention deficits, impulsivity, and hyperactivity with or without conduct problems: Relationships to delinquency and unique contextual factors. In R. J. McMahon & R. D. Peters (Eds.), Behavior disorders of adolescence: Research, intervention, and policy in clinical and school settings (pp. 39–61). New York: Plenum Press.
- Lozier, L. M., Cardinale, E. M., VanMeter, J. W., & Marsh, A. A. (2014). Mediation of the relationship between callous–unemotional traits and proactive aggression by amygdala response to fear among children with conduct problems. JAMA Psychiatry, 71, 627–636.
- Lynam, D. R. (1996). The early identification of chronic offenders: Who is the fledgling psychopath? *Psychological Bulletin*, 120, 209–234.
- Lynam, D. R. (1998). Early identification of the fledgling psychopath: Locating the psychopathic child in the current nomenclature. *Journal of Abnormal Psychology*, 107, 566–575.
- Magnusson, D. (1987). Adult delinquency in the light of conduct and physiology at an early age: A longitudinal study. In D. Magnusson & A. Ohman (Eds.), *Psychopathology: An interactional perspective* (pp. 221– 253). New York: Academic Press.
- Marsee, M. A., Barry, C. T., Childs, K. K., Frick, P. J., Kimonis, E. R., Muñoz, L. C., et al. (2011). Assessing the forms and functions of aggression using selfreport: Factor structure and invariance of the Peer Conflict Scale in youths. *Psychological Assessment*, 23, 792–804.
- Marsee, M. A., & Frick, P. J. (2007). Exploring the cognitive and emotional correlates to proactive and reactive aggression in a sample of detained girls. *Journal* of Abnormal Child Psychology, 35, 969–981.
- Marsee, M. A., & Frick, P. J. (2010). Callous–unemotional traits and aggression in youth. In W. Arsenio & E. Lemerise (Eds.), Emotions, aggression, and morality in children: Bridging development and psychopathology (pp. 137–156). Washington, DC: American Psychological Association.

- Marsee, M. A., Frick, P. J., Barry, C. T., Kimonis, E. R., Centifanti, L. C. M., & Aucoin, K. J. (2014). Profiles of the forms and functions of self-reported aggression in three adolescent samples. *Development and Psychopathology*, 26, 705–720.
- Marsee, M. A., Silverthorn, P., & Frick, P. J. (2005). The association of psychopathic traits with aggression and delinquency in non-referred boys and girls. *Behavioral Sciences and the Law*, 23, 803–817.
- Marsh, A. A., Finger, E. C., Schechter, J. C., Jurkowitz, I. T. N., Reid, M. E., & Blair, R. J. R. (2011). Adolescents with psychopathic traits report reductions in physiological responses to fear. *Journal of Child Psy*chology and Psychiatry, 52, 838–841.
- McAuliffe, M. D., Hubbard, J. A., Rubin, R. M., Morrow, M. T., & Dearing, K. F. (2007). Reactive and proactive aggression: Stability of constructs and relations to correlates. *Journal of Genetic Psychology*, 167, 365–382.
- McMahon, R. J., Witkiewitz, K., Kotler, J. S., & the Conduct Problems Prevention Research Group. (2010). Predictive validity of callous–unemotional traits measures in early adolescence with respect to multiple antisocial outcomes. *Journal of Abnormal Psychology*, 119, 752–763.
- Miller, J. D., & Lynam, D. R. (2003). Psychopathy and the five-factor model of personality: A replication and extension. *Journal of Personality Assessment*, 81, 168–178.
- Moffitt, T. E. (1990). Juvenile delinquency and attention-deficit disorder: Developmental trajectories from age 3 to 15. Child Development, 61, 893–910.
- Moffitt, T. E. (2006). Life-course persistent versus adolescence-limited antisocial behavior. In D. Cicchetti & D. J. Cohen (Eds.), Developmental psychopathology: Vol. 3. Risk, disorder, and adaptation (2nd ed., pp. 570–598). New York: Wiley.
- Moffitt, T. E., & Caspi, A. (2001). Childhood predictors differentiate life-course persistent and adolescencelimited antisocial pathways in males and females. *Development and Psychopathology*, 13, 355–376.
- Moffitt, T. E., Caspi, A., Dickson, N., Silva, P., & Stanton, W. (1996). Childhood-onset versus adolescentonset antisocial conduct problems in males: Natural history from ages 3 to 18 years. *Development and Psychopathology*, 8, 399–424.
- Moffitt, T. E., Caspi, A., Harrington, H., & Milne, B. J. (2002). Males on the life-course persistent and adolescence-limited pathways: Follow-up at age 26 years. *Development and Psychopathology*, 14, 179–207.
- Moffitt, T. E., & Henry, B. (1989). Neuropsychological assessment of executive functions in self-reported delinquents. Development and Psychopathology, 1, 105–118.
- Moffitt, T. E., & Silva, P. A. (1988). Self-reported delinquency, neuropsychological deficit, and history of attention deficit disorder. *Journal of Abnormal Child Psychology*, 16, 553–569.
- Moran, P., Ford, T., Butler, G., & Goodman, R. (2008). Callous and unemotional traits in children and ado-

lescents living in Great Britain. British Journal of Psychiatry, 192, 65–66.

- Moul, C., Killcross, S., & Dadds, M. R. (2012). A model of differential amygdala activation in psychopathy. *Psychological Review*, 119, 789–806.
- Muñoz, L. C., Frick, P. J., Kimonis, E. R., & Aucoin, K. J. (2008). Types of aggression, responsiveness to provocation, and callous–unemotional traits in detained adolescents. *Journal of Abnormal Child Psychology*, 36, 15–28.
- Murrie, D. C., Boccaccini, M. T., McCoy, W., & Cornell, D. (2007). Diagnostic labeling in juvenile court: How do psychopathy and conduct disorder findings influence judges? *Journal of Clinical Child and Adolescent Psychology*, 36, 228–241.
- Musser, E. D., Galloway-Long, H. S., Frick, P. J., & Nigg, J. T. (2013). Emotional regulation and heterogeneity in attention deficit hyperactivity disorder. *Journal of the American Academy of Child and Adolescent Psychiatry*, 52, 163–171.
- Newcorn, J. H., & Halperin, J. M. (2000). Attentiondeficit disorders with oppositionality and aggression. In T. E. Brown (Ed.), Attention-deficit disorders and comorbidities in children, adolescents, and adults (pp. 171–207). Washington, DC: American Psychiatric Press.
- Odgers, D. L., Moffitt, T. E., Broadbent, J. M., Dickson, N., Hancox R. J., Harrington, H., et al. (2008). Female and male antisocial trajectories: From childhood origins to adult outcomes. *Developmental Psychopathology*, 20, 673–716.
- Ostrov, J. M., & Houston, R. J. (2008). The utility of forms and functions of aggression in emerging adulthood: Association with personality disorder symptomology. *Journal of Youth and Adolescence*, 37, 1147– 1158.
- Pardini, D. A., Lochman, J. E., & Frick, P. J. (2003). Callous/unemotional traits and social cognitive processes in adjudicated youth. *Journal of the American Academic of Child and Adolescent Psychiatry*, 42, 364–371.
- Pardini, D. A., Stepp, S., Hipwell, A., Stouthamer-Loeber, M., & Loeber, R. (2012). The clinical utility of the propose DSM-5 callous–unemotional subtype of conduct disorder in young girls. *Journal of the Ameri*can Academy of Child and Adolescent Psychiatry, 51, 62–73.
- Pasalich, D. S., Dadds, M. R., Hawes, D. J., & Brennan, J. (2012). Do callous–unemotional traits moderate the relative importance of parental coercion versus warmth in child conduct problems?: An observational study. Journal of Child Psychology and Psychiatry, 52, 1308–1315.
- Patrick, C. J., Zempolich, K. A., & Levenston, G. K. (1997). Emotionality and violent behavior in psychopaths: A biosocial analysis. In A. Raine, D. Farrington, P. Brennan, & S. A. Mednick (Eds.), *The biosocial bases of violence* (pp. 145–161). New York: Plenum Press.

- Patterson, G. R., Reid, J. B., & Dishion, T. J. (1992). Antisocial boys. Eugene, OR: Castilia.
- Pitts, T. B. (1997). Reduced heart rate levels in aggressive children. In A. Raine, P. A. Brennan, D. P. Farrington, & S. A. Mednick (Eds.), *Biosocial bases of violence* (pp. 317–320). New York: Plenum Press.
- Prinstein, M. J., Boergers, J., & Vernberg, E. M. (2001). Overt and relational aggression in adolescents: Social-psychological adjustment of aggressors and victims. *Journal of Clinical Child Psychology*, 30, 479–491.
- Quay, H. C. (1964). Dimensions of personality in delinquent boys as inferred from the factor analysis of case history data. *Child Development*, 35, 479–484.
- Quay, H. C. (1986). Classification. In H. C. Quay & J. S. Werry (Eds.), Psychopathological disorders of childhood (3rd ed., pp. 1–42). New York: Wiley.
- Quay, H. C. (1987). Patterns of delinquent behavior. In H. C. Quay (Ed.), Handbook of juvenile delinquency (pp. 118–138). New York: Wiley.
- Quay, H. C. (1993). The psychobiology of undersocialized aggressive conduct disorder. *Development and Psychopathology*, 5, 165–180.
- Raine, A. (2002). Biosocial studies of antisocial and violent behavior in children and adults: A review. Journal of Abnormal Child Psychology, 30, 311–326.
- Rockett, J., Murrie, D. C., & Boccaccini, M. T. (2007). Diagnostic labeling in juvenile justice settings: Do psychopathy and conduct disorder findings influence clinicians? *Psychological Services*, 4, 107–122.
- Roose, A., Bijttebier, P., Decoene, S., Claes, L., & Frick, P. J. (2010). Assessing the affective features of psychopathy in adolescence: A further validation of the Inventory of Callous and Unemotional traits. Assessment, 17, 44–57.
- Rothbart, M. K., Ahadi, S. A., & Hershey, K. (1994). Temperament and social behavior in childhood. Merrill–Palmer Quarterly, 40, 21–39.
- Rothbart, M. K., & Bates, J. E. (1998). Temperament. In W. Damon (Ed.), Handbook of child psychology: Vol. 3. Social, emotional, and personality development (pp. 105–176). New York: Wiley.
- Rowe, R., Maughan, B., Moran, P., Ford, T., Briskman, J., & Goodman, R. (2010). The role of callous unemotional traits in the diagnosis of conduct disorder. *Journal of Child Psychology and Psychiatry*, 51, 688–695.
- Rutter, M. (2012). Psychopathy in childhood: Is it a meaningful diagnosis? British Journal of Psychiatry, 200, 175–176.
- Silverthorn, P., Frick, P. J., & Reynolds, R. (2001). Timing of onset and correlates of severe conduct problems in adjudicated girls and boys. *Journal of Psychopathology and Behavioral Assessment*, 23, 171–181.
- Skeem, J. L., & Cooke, D. J. (2010). Is criminal behavior a central component of psychopathy?: Conceputal directions for resolving the debate? *Psychological As*sessment, 22, 433–445.
- Stickle, T. R., Marini, V. A., & Thomas, J. N. (2012).

Gender differences in psychopathic traits, types, and correlates of aggression among adjudicated youth. *Journal of Abnormal Child Psychology*, 40, 513–525.

- Thompson, R. A., & Newton, E. K. (2010). Emotion in early conscience. In W. F. Arsenio & E. A. Lemerise (Eds.), Emotions, aggression, and morality in children: Bridging development and psychopathology (pp. 13–31). Washington DC: American Psychological Association.
- Vidal, S., & Skeem, J. L. (2007). Effect of psychopathy, abuse, and ethnicity on juvenile probation officers' decision-making and supervision strategies. *Law and Human Behavior*, 31, 479–498.
- Viding, E., Blair, R. J. R., Moffitt, T. E., & Plomin, R. (2005). Evidence for substantial genetic risk for psychopathy in 7-year-olds. *Journal of Child Psychology* and Psychiatry, 46, 592–597.
- Viding, E., Sebastian, C. L., Dadds, M. R., Lockwood, P. L., Cecil, C. A., De Brito, S. A., et al. (2012). Amygdala response to preattentive masked fear in children with conduct problems: The role of callous–unemotional traits. *American Journal of Psychiatry*, 169, 1109–1116.
- Vitacco, M. J., Rogers, R., & Neumann, C. S. (2003). The Antisocial Process Screening Device: An exam-

ination of its construct and criterion-related validity. Assessment, 10, 143–150.

- Vitaro, F., Brendgen, M., & Tremblay, R. E. (2002). Reactively and proactively aggressive children: Antecedent and subsequent characteristics. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 43, 495–506.
- Waschbusch, D. A. (2002). A meta-analytic examination of comorbid hyperactive–impulsive–attention problems and conduct problems. *Psychological Bulletin*, 128, 118–150.
- White, S. F., Brislin, S. J., Meffert, H., Sinclair, S., & Blair, R. J. R. (2013). Callous–unemotional traits modulate the neural response associated with punishing another individual during social exchange: A preliminary investigation. *Journal of Personality Dis*orders, 27, 99–112.
- Woodworth, M., & Porter, S. (2002). In cold blood: Characteristics of criminal homicides as a function of psychopathy. *Journal of Abnormal Psychology*, 111, 436–445.
- Xu, Y., Raine, A., Yu, L., & Krieg, A. (2014). Resting heart rate, vagal tone, and reactive and proactive aggression in Chinese children. *Journal of Abnormal Child Psychology*, 42, 501–514.

# PART V

# PSYCHOPATHY IN SPECIFIC SUBPOPULATIONS

### CHAPTER 20

# Psychopathy in Children and Adolescents

Assessment and Critical Questions Regarding Conceptualization

#### RANDALL T. SALEKIN HENRIK ANDERSHED ABBY P. CLARK

n the 1990s, considerable interest and debate regarding the study of psychopathy in children and adolescents was initiated by the pathbreaking work of Adelle Forth (Forth, Hare, & Hart, 1990). The interest and scientific literature on child psychopathy has grown substantially since then—as reflected in numerous influential journal articles; special issues of leading journals focused on child psychopathy; books devoted to the topic, including the Handbook of Child and Adolescent Psychopathy (Salekin & Lynam, 2010); continuing advances in methods for assessing psychopathy in young people; as well as the inclusion of a psychopathic features ("limited prosocial emotions") specifier for the diagnosis of conduct disorder in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association [APA], 2013). Owing to this strong scholarly interest and intense investigative effort, the knowledge base for psychopathy has expanded to the point that firmer conclusions can now be advanced regarding the nature and basis of psychopathic tendencies in young people.

Despite these notable advances, key unresolved questions still surround the topic of psychopathy in youthful populations. Primary among these are the following: What are the defining features of psychopathy in children and adolescents? Should one particular set of symptoms be considered especially central, or "core," to the diagnosis? And, relative to how we conceive of psychopathy and its defining features, how well do measures devised to index psychopathy in younger samples actually capture this conceptualization? In addition to these definitional issues, other pertinent questions remain: How early does this clinical condition arise? How stable is it across time and developmental periods? What are the reliable cognitive and emotional correlates of psychopathy in youth, and what do these correlates tell us (if anything) about its etiological basis? How treatable is this condition, and to what extent can early intervention moderate the expression of strong genotypic-dispositional tendencies toward psychopathy? These questions resonate strongly with researchers and clinicians alike, and are likely to persist in importance given the status of psychopathy as a salient target of interest in both clinical and forensic settings (Farrington, 2005; Forth, 1995; Salekin, 2015, 2016a; Vitacco & Salekin, 2013).

The purpose of this chapter is to review what is currently known about the conceptualization and assessment of psychopathy in childhood, and to offer perspective on where investigative work in this area can proceed from here using the aforementioned questions as a guide. In the service of this broad goal, the chapter is organized around five specific aims. First, we consider how psychopathy relates to conditions listed in the "Disruptive Behavior Disorders" section of DSM-5, devoting special attention to the diagnosis of conduct disorder with limited prosocial emotions (CD+LPE) as a means to capture child psychopathy. Second, we review findings from developmental studies testing the extent to which psychopathic tendencies can be identified reliably and effectively, in terms of predicting meaningful outcomes, at early ages. Third, to further address the question of how applicable the diagnosis is to youth, we summarize existing evidence regarding the structural properties and criterion-related validity of differing established measures of child/adolescent psychopathy. Fourth, we review etiological theories and relevant research findings, including data from neuroscience. Fifth, we outline directions for future research, with an emphasis on ways to improve investigative approaches and interpretability of findings in this crucial area of study. In this latter section of the chapter, we also address issues such as the need for continuing research directed at clarifying relations between child psychopathy and the childhood diagnoses in the DSM. This includes further considerations of the new CD+LPE conception in DSM-5 and conceptions of childhood disorders in the forthcoming (11th) edition of the International Classification of Diseases (ICD-11; World Health Organization, 2018).

#### Psychopathy and DSM-5 Disruptive Behavior Disorders

DSM-5 lists three main disruptive behavior disorders: oppositional defiant disorder (ODD), conduct disorder (CD), and attention-deficit/hyperactivity disorder (ADHD). Each of these conditions has been shown to be reasonably reliable and to have some degree of predictive merit. Two of these, ODD and CD, have been most frequently discussed in terms of their connection to psychopathy although ADHD has also been considered (see Lynam, 1996). The potential similarities and differences that ODD, CD, and ADHD show with psychopathy has been a topic of some discussion over the years. However, the current DSM conditions of ODD, CD, and ADHD do not adequately capture psychopathic traits and it has been argued that they are inherently heterogeneous, requiring further delineation. This was most recently seen with research that parceled ODD symptoms to improve prediction (Stringaris & Goodman, 2009a, 2009b).

One other key approach to reducing the heterogeneity of the DSM disruptive behavior diagnoses and especially CD is to demarcate variants with salient psychopathic features (Andershed & Andershed, 2008; Burke, Loeber, & Lahey, 2007; Farrington, 2005; Moffitt et al., 2008). This was the motivation behind inclusion of the LPE specifier for the DSM-5 CD. However, the degree to which this specification will reduce heterogeneity and contribute to what we know about CD is not well known and is currently a point of disagreement (see Frick, Ray, Thornton, & Khan, 2014; Lahey, 2014). A primary question that has been raised pertains to whether the LPE specifier will simply overlap with the diagnosis of CD or identify a more severe subgroup of youth with CD (Lahey, 2014). This contention is reminiscent of the perspectives of Robins (1966, 1978) and Spitzer (Spitzer, Endicott, & Robins, 1975), and subsequently Cloninger (1978), who considered callous symptoms to be tapped indirectly but effectively by serious behavioral deviance items (e.g., bullying and threatening others, forcing someone into sexual activity, armed robbery, deliberate fire setting, cruelty to animals and people). A second key question pertains to the degree to which the LPE symptoms improve the representation of psychopathy in DSM-5. By using seminal models of psychopathy (Cleckley, 1941; Karpman, 1941; McCord & McCord, 1959/1964) and established operationalizations of these models as referents (e.g., Andershed, Kerr, Stattin, & Levander, 2002; Frick & Hare, 2001; Hare, 1991/2003; Lilienfeld & Andrews, 1996), one can begin to evaluate how well the newly introduced CD+LPE diagnosis in DSM-5 captures psychopathy as classically conceived.

## How Does Psychopathy Map with DSM-5 Diagnoses?

Psychological measurement research has developed statistical methods for evaluating the fit of proposed models of clinical and individual-difference phenomena. This research has shown that two considerations are especially important in assessing how well a manifest measure, or in this case diagnostic category, captures a target construct (Clark & Watson, 1995; Loevinger, 1957). First, the conceptual representation of items comprising the diagnostic category must be evaluated. Second, and relatedly, the relevance of items to the diagnostic category of interest must be subjected to empirical tests. The importance of the representativeness and relevance of items was highlighted in a special section in the journal Psychological Assessment on test development edited by Clark and Watson (1995). These authors stressed the need to be inclusive of items covering the target construct (applicable to diagnostic categories), to evaluate the psychometric functioning of individual test items, and to establish an appropriate structural (factor-analytic) model of the test to provide for validation of the test (or relatedly diagnostic category), at both higher (total score) and lower (subscale and factor scores) levels. These key points were also underscored early by Loevinger (1957), who highlighted the importance of establishing representation: "The items of the pool should be chosen so as to sample all possible contents which might comprise the putative trait (diagnostic category) according to all known alternative theories of the trait" (p. 659). Loevinger also stated that "if theory is fully to profit from test [or concept] construction . . . every item must be accounted for" (p. 657). In the two subsections that follow, we examine the correspondence between DSM disruptive disorder (CD, ODD, ADHD) symptoms and psychopathic features as outlined by Cleckley (1976) and Hare (1991/2003), and comment on the relevance of the new LPE specifier items.

#### Correspondence between DSM-5 CD, ODD, ADHD, and Psychopathy

Fifteen symptoms comprise the diagnostic criteria for CD. These symptoms are grouped into four categories: (1) aggression toward people and animals, (2) destruction of property, (3) deceitfulness or theft, and (4) serious violation of rules. Of the 15 items that make up the symptom pool for potential CD diagnoses, only 1 (i.e., "often lies") appears to correspond directly with Cleckley's (1976) criteria. When the four criteria comprising the LPE specifier are added to those for CD (to reflect CD+LPE), only three of the resulting 19 items ("lack of remorse," "shallow affect," and "often lies") map directly onto Cleckley's criteria. When examining these 19 DSM items against Hare's (1991/2003) criteria for psychopathy, contained in his Psychopathy Checklist—Revised (PCL-R), only six of these 20 PCL-R psychopathy criteria ("often lies," "lacks remorse," "lacks empathy," "shallow affect," "early behavioral problems," "serious criminal behavior") have counterparts in the CD+LPE item set. Thus, considering the Cleckley (1976) or Hare (1991/2003) as reference points, the correspondence between the DSM-5 CD+LPE specifier and psychopathy, in our view, continues to be quite low.

Eight possible symptoms comprise the diagnostic criteria for ODD. Findings from recent studies (e.g., Burke & Loeber, 2010; Stringaris & Goodman, 2009b; but see Burke et al., 2014) indicate that these criteria encompass three distinct dimensions that provide perspective on the nature of ODD and its heterogeneity: (1) irritable, (2) oppositional, and (3) spiteful, or headstrong. In DSM terminology, these dimensions have been referred to as angry-irritable mood, argumentative-defiant behavior, and vindictiveness. Studies have shown that the irritable dimension of ODD is associated positively with anxiety and depression. Other work (e.g., Krieger et al., 2013; Stringaris & Goodman, 2009b; Stringaris, Cohen, Pine, & Leibenluft, 2009; Stringaris, Maughan, & Goodman, 2010) indicates that the oppositional dimension is linked to mild CD, and that the spitefulvindictive component may relate to severe CD and to callous-unemotional (CU) traits, a component of child psychopathy (Frick & Marsee, Chapter 19, this volume). Although these symptom dimensions are helpful for clarifying heterogeneity in the expression of ODD, and provide some (albeit weak) connection to CU traits, the correspondence between the DSM-5 ODD diagnosis and psychopathy as classically conceived is low, as none of the ODD items directly overlap with Cleckley's (1976) criteria or those of more modern theoretical models (e.g., Hare, 1991/2003; Patrick, 2010; Patrick, Fowles, & Krueger, 2009).

Regarding the DSM diagnosis of ADHD, there are 18 possible symptom criteria considered in rendering this diagnosis. Of these, only one symptom corresponds roughly to descriptors used by Cleckley (1976) or Hare (1991/2003)—namely, "is often 'on the go,' acting as if 'driven by a motor.' " This symptom criterion appears most closely related to the "need for stimulation" item of Hare's PCL-R. Other symptoms included among the criteria for ADHD are not necessarily inconsistent with psychopathy, but they also do not specifically define it. Thus, the correspondence between ADHD and psychopathy is also low.

A related issue to consider when examining item correspondence is the relevance of items. Although the items of the newly added LPE specifier for CD are considered indicative of psychopathy, the relevance of two of the four items of the specifier has been questioned. Lahey (2014) raised concerns in particular about the item "shallow affect," suggesting that the wording of items intended to tap poverty of emotions may require refinement: "It is possible that an important element of deficient emotions is closely related to 'sympathetic concern' and capacity for guilt, but most of the items used in previous studies may not have been written to detect these deficits" (p. 60). Lahey further suggested that the LPE "shallow affect" item may fail to capture tendencies on the part of psychopathic individuals to exhibit "cold insensitivity to the feelings and needs of others" and "calm reactions to the discovery of their misdeeds," while at the same time being able to "show a normal range of happiness when they get their way" (p. 60).

These points raised by Lahey (2014) serve to highlight difficulties in specifying what exactly shallow affect signifies because of the range of emotions psychopathic individuals appear able to display, even if only in certain contexts (e.g., joy after evading detection of a devious act). Another potential concern with respect to shallow affect is measures such as the Inventory of Callous-Unemotional Traits (ICU; Kimonis et al., 2008; Viding & Kimonis, Chapter 7, this volume), which was designed specifically to index CU traits, show positive rather than inverse relations with measures of anxiousness-negative affectivity (e.g., Berg et al., 2013; Gao & Zhang, 2016; Latzman, Lilienfeld, Latzman, & Clark, 2013). Because of these concerns, "shallow affect" as currently characterized in the LPE specifier may require further delineation and examination in young people.

The relevance of the LPE symptom criterion "unconcerned about performance" has also been questioned and may pose particular problems because it does not relate clearly, or distinctively, to established conceptions of psychopathy (Berg et al., 2013; Lahey, 2014; Latzman et al., 2013). Two ostensibly related criteria for PCL-R psychopathy, "lacks long-term goals" and "fails to accept responsibility," have been shown to function poorly as indicators of psychopathy in two separate item response theory (IRT) studies utilizing Forth and colleagues' (1996/2003) Youth Version of the PCL-R (PCL:YV; Dillard, Salekin, Barker, & Grimes, 2013; Tsang et al., 2015). However, even if the LPE item "unconcerned about performance" is indicative of psychopathy in younger samples, it would suffer from lack of diagnostic specificity if, as seems likely, it is found to apply to other mental health conditions (e.g., CD without LPE, ADHD, autism spectrum disorders, major depression, substance use disorders)—and to some portion of adolescents without diagnosable problems. In summary, we believe there are grounds for questioning whether psychopathic traits are effectively represented in the youth diagnoses in the DSM, even with the addition of the new LPE specifier.

#### Capturing the Construct Domain of Psychopathy

It should be noted that the set of criteria or features used to define a clinical condition is a matter of vital importance, as it relates to the prevalence, external correlates (e.g., intelligence, social skills, aggressive tendencies), underlying motivations, etiology, and treatability/prognosis of the condition (e.g., Cleckley, 1976; Lahey, 2014; Loney, Frick, Ellis, & McCoy, 1998; Quay, 1964, 1987; Salekin & Frick, 2005; Salekin, Neumann, Leistico, & Zalot, 2004). Issues regarding representativeness and relevance are also important in relation to matters of arbitrary metrics (labeling a scale "psychopathy" whose items tap something entirely different) and misdiagnoses. Thus, the need to further clarify how psychopathy can be captured in definitional terms remains a high priority in seeking to understand the nature and bases of this condition in younger samples.

To institute a well-validated CD diagnosis, with adequate specifiers that effectively reflect psychopathy (Cleckley, 1976; Hare, 1991/2003), the criteria for the diagnosis would need to capture a larger range of psychopathic traits, including interpersonal, affective, and behavioral features (and perhaps even motivational tendencies; Cleckley, 1976; Hare, 1991/2003; Kazdin, 1997; Patrick, 2010). Factor-analytic studies of differing psychopathy inventories have consistently revealed either two broad factors, or three or four coherent subfactors ("facets"). Importantly, the finding of distinct subdimensions to psychopathy has been replicated numerous times across a wide variety of samples, including child, adolescent, adult, clinic-referred, and nonclinical samples (e.g., Andershed et al., 2002; Frick, Bodin, & Barry, 2000; Hare, 1991/2003; Jones, Cauffman, Miller, & Mulvey, 2006; Kosson et al., 2013; Patrick et al., 2009; Salekin, Brannen, Zalot, Leistico, & Neumann, 2006).

Concerning the structure of psychopathy in youth, Frick (2009) stated that "factor analyses have consistently identified three dimensions [interpersonal, affective, impulsive], in addition to antisocial behavior, similar to those identified in adult samples" (p. 805). More recently, Hawes, Mulvey, Schubert, and Pardini (2014) stated that "psychopathy is a complex personality disorder characterized by interpersonal, affective, and behavioral dimensions" (p. 623). Thus, the recognition of the multidimensionality of psychopathy appears to be ubiquitous (see also Skeem, Polaschek, Patrick, & Lilienfeld, 2011). However, the question remains as to whether differing symptomatic components of psychopathy evident in adult and adolescent samples are observable from an early age. We examine in the next section whether psychopathy, and the facets that underpin it, can be detected and effectively quantified at very young ages.

#### Can Psychopathy Be Observed in Children?

The large amount of work devoted to the study of CU traits to date indicates that this facet of psychopathy is evident and measurable in young children (Frick & White, 2008; but also see Berg et al., 2013). However, the interpersonal and impulsive–irresponsible features (or "lifestyle"; Forth et al., 1996/2003) have been less clearly quantified, and less often investigated as isolated constructs. Thus, key questions remain regarding the status, symptomatic expression, and correlates of these components of psychopathy in youth (Hart, Watt, & Vincent, 2002; Salekin & Frick, 2005; Seagrave & Grisso, 2002; Vincent & Hart, 2002).

In the next section, we review developmental literature on the underlying trait elements of psychopathy that indicate this condition arises and can be assessed early in life. Consistent with our earlier emphasis on the representativeness of psychopathy items, we consider available data pertaining to each subdimension of psychopathy (interpersonal, affective, and behavioral/lifestyle) in youthful samples. Although we do not devote specific coverage to the antisocial dimension, we do view antisocial behavior as important to psychopathy, especially given its connections to CD (Quay, 1987). Later in the chapter, we provide descriptions of alternative measures that have been developed for indexing psychopathy in youthful populations and examine the item representativeness of these measures using descriptions by Cleckley (1976) and Hare (1991/2003) as referential anchors.

#### Interpersonal Style: Charm, Arrogance, and Manipulation

Psychopathic individuals are considered to be superficially charming, glib, arrogant, manipulative, and deceitful toward others. Despite some theory suggesting that several of these characteristics may be normative in adolescents (Elkind, 1967), research findings to date indicate that early on, pathological levels of these symptoms are also evident (Evans & Lee, 2013; Lewis, Stanger, & Sullivan, 1989; Parry, 2006; Peskin, 1992; Talwar & Crossman, 2011). Research has shown that even young children can dominate others excessively (Assary, Salekin, & Barker, 2015), tell strategic lies (Evans, Xu, & Lee, 2011; Fu, Evans, Xu, & Lee, 2012), and deliberately mislead others (Hsu & Cheung, 2013; Polak & Harris, 1999). Moreover, the differences between age-normative lying and more pathological forms of deceptiveness may emerge early in development (Waller et al., 2012). Past research has shown that even in preschoolers, a smaller subset of children can be identified and seen by others as chronic liars (Stouthamer-Loeber, 1986). In a review of the empirical literature on childhood lying, Stouthamer-Loeber reported that although some experimentation with deceit is common at the age of 4 years (parents and teachers reported one or more instances of lying in 75% of target children), prevalence rates for chronic lying are much lower (14.4% according to teacher report, and 19.4% according to parent report). Additionally, Stouthamer-Loeber noted, on the basis of the limited longitudinal research available, that the proportion of frequent liars in school-age samples remained the same, or increased slightly, over time. This conclusion accords with the findings of a recent, large-sample empirical study by Waller and colleagues (2012).

Other studies have shown that egocentric traits, such as the desire to be the center of attention, and to be highly confident of oneself, can be observed and measured early in childhood (e.g., Caprara, Vecchione, Barbaranelli, & Alessandri, 2013; Carlson & Gejerde, 2009; Cramer, 2011; Scholte, Stoutjesdijk, Van Oudheasden, Lodewijks, & Van der Ploeg, 2011; Thomaes, Bushman, de Castro, Cohen, & Denissen, 2009; Thomaes,
Bushman, Orobrio de Castro, & Stegge, 2009b). Moreover, egocentric traits can be enduring, as egocentric tendencies measured at age 3 have been shown to forecast arrogant personality style in young adulthood (Carlson & Gejerde, 2009; Cramer, 2011). Findings from research by Barry, Frick, and Killian (2003) further support these notions. These investigators found significant differences on a child narcissism scale between youth scoring high versus low on the interpersonal features of psychopathy-indicating that children are capable of appraising their self-worth, that an exaggerated and/or distorted self-view may be observable from an early age, and that such distorted views may extend beyond developmental egocentricity exhibited in adolescence (Johnstone & Cooke, 2004; see also Chabrol, van Leeuwen, Rodgers, & Gibbs, 2011). These results coincide with results from an earlier study by Harter (1990), which indicate that by the age of 8, children had developed a view of their overall selfworth. Self-perceptions of extreme self-worth that include beliefs of superiority have been predictive of proactive aggression and ringleader bullying (e.g., Ang, Ong, Lim, & Lim, 2010; Barry et al., 2007; Bukowski, Schwartzman, Santo, Bagwell, & Adams, 2009; Kerig & Stellwagen, 2010; Stellwagen & Kerig, 2013; Washburn, McMahon, King, Reinecke, & Silver, 2004).

Ringleader bullying often requires skill to gain allegiance. Stellwagen and Kerig (2013) noted this when they discovered that in children as young as 10, the interpersonal features of psychopathy were associated with better perspective taking and were more predictive of ringleader bullying than either CU traits or impulsivity. Salmivalli (2001) likewise demonstrated that some youth who report feeling quite good about themselves simultaneously engage in hurtful behavior toward others (see also, Ojanen, Findley, & Fuller, 2012; Salmivalli & Nieminen, 2002; Washburn et al., 2004). In another study, Pauletti, Menon, Menon, Tobin, and Perry (2012) found that interpersonal manipulativeness in young children (M = 11.3) is related not only to heightened aggression but also reduced prosocial behavior. Lau and Marsee (2013) reported unique associations for interpersonal traits with aggressive behavior and delinquency that exceeded predictive relations for CU traits. Aside from the host of negative outcomes that are associated with arrogance and manipulation, there is also evidence that feelings of superiority, especially when challenged, can give rise to violent behavior (Baumeister, Smart, & Boden, 1996; Jordan, Spencer, Zanna, Hoshino-Browne, & Correll, 2003; Stucke & Sporer, 2002).

Recent research suggests that parenting may be relevant in the development of both feelings of superiority and arrogance, and a manipulative interpersonal style. It is thought that parental leadership and support combined with low warmth and high psychological control may potentially contribute to feelings of superiority over others, while also fostering leadership beliefs (Horton & Tritch, 2014; Jonason, Lyons, & Bethell, 2014; Kraut & Price, 1976). However, gene  $\times$  environment (G  $\times$ E) studies are needed on this topic. In summary, available evidence indicates that interpersonal traits can be observed quite early in development and, like other traits, have a heritable basis, but may also be influenced in positive or negative ways by parenting and by the child's interactions with peers and others in the environment (see Patterson, 1976).

### Affective Impairment: Deficient Empathy and Emotional Coldness

Psychopathic individuals are also considered to be callous, cold, and uncaring about others, and able to transgress against innocent individuals with little concern for the damage they cause. Considerable evidence indicates that conscience development and the internalization of societal values are initiated as early as the toddler years (e.g., Barker, Oliver, Viding, Salekin, & Maughan, 2011; Kochanska, Koenig, Barry, Kim, & Yoon, 2010; Roth-Hanania, Davidov, & Zahn-Waxler, 2011). Developmental science has shown that by 18 months of age, the essentials for affective capacities such as perspective taking and differentiating between self and others are in place. Research has also shown that very young children display empathy, compassion, and moral sensitivity to the wishes and needs of others (Dunn, 1987; Eisenberg & Mussen, 1989; Haan, Aerts, & Cooper, 1987; Johnstone & Cooke, 2004; Malti & Krettenauer, 2013; Zahn-Waxler & Radke-Yarrow, 1990). For instance, Roth-Hanania and colleagues (2011) reported that cognitive and affective indicators of empathy were present at ages 8 and 10 months, and continued to increase gradually into the second year. In another study, Bandstra, Chambers, McGrath, and Moore (2011) found that children ranging from 18 to 36 months (M = 26.44) exhibited empathic concern and personal distress in response to simulations of adults pain and sadness. Correspondingly, children as young as 22 months show responses that reflect tension (e.g., bodily signals, gaze aversion) when signaled that they have done something wrong (Knafo et al., 2009; McDonald & Messinger, 2011). These findings suggest that pathological responses with regard to empathy, like coldness, guiltlessness, callousness, and perhaps even deliberately cruel ("mean") toward others, may also be observed in very young children (Balacchi & Farina, 2012).

Although genetics research supports a role for heritable influences in conscience development, research also underscores the importance of early social referencing, where mothers and young children negotiate affective meaning of behavioral acts. Kochanska and colleagues (2010; Kochanska, 1993) have documented associations between parenting practices and the development of conscience in young children. Along similar lines, Barrett and Campos (1987) proposed that social referencing provides events with significance, including emotional marking of acts that parents consider undesirable, and Emde, Biringen, Clyman, and Oppenheim (1991) pointed out that early social referencing is essential for establishing initial prohibitions against deviant acts. Thus, as with research on the interpersonal features of psychopathy, available data pertaining to the affective features of the condition indicate that parental practices may either promote or undermine early elements of internalization of conscience.

# Unreserved Behavior: Daringness and Proneness to Boredom

Psychopathic individuals are viewed as daring, irresponsible, and prone to boredom. They are also thought to be high in sensation-seeking tendencies. These traits have also been investigated in young children. Moreover, effortful control, self-regulation, and other related concepts have also been studied (Frick, O'Brien, Wootton, & McBurnett, 1994). Effortful control and self-regulation refer to the capability of voluntarily governing one's behavioral impulses (Chacko, Kofler, & Jarrett, 2014; Kochanska et al., 2010; Ponitz, McClelland, Matthews, & Morrison, 2009), and variations in these attributes have been shown to be measurable in preschool children. Studies on inhibitory control have documented that between approximately age 2 (22 months) and 3 years (33 months), children develop simple regulatory skills such as quelling motor responses (Carlson, 2005; Kochanska et al., 2010). Between ages 3 and 5 years, developmental spurts occur, in which more complex inhibition skills become evident (Garon, Bryson, & Smith, 2008). For example, effortful control begins to emerge early in the second year of life and becomes highly stable before the age of 4 (e.g., Kochanska et al., 2010). Behaviors such as awaiting a turn and interrupting or intruding others have been shown to be measurable in children as young as age 3 years (Egger & Angold, 2006; Willoughby, Blair, Wirth, & Greenberg, 2012).

Recently, and perhaps most highly relevant to psychopathy, sensation seeking and proneness to boredom have been examined in children as young as age 2 years, taking into account the child's risktaking behavior (e.g., Morrongiello, Sandomierski, & Vall, 2012). Although engagement in some risky behavior may be common among children (Sandseter & Kennair, 2012), emerging research on this topic suggests that variation in such behavior is possible to assess at a very young age, with certain youth being quite high in risk-taking and others being distinctly low (Morrongiello & Lasenby, 2006). For example, in a study that evaluated children ages 2-5 years for sensation-seeking tendencies, Morrongiello and colleagues (2012) found that very young "daredevils" could be reliably identified.

Although the previously reviewed studies indicate that daring behavior can be indexed effectively in childhood, it is generally non-normative. In fact, only between one-fifth and one-third of children display salient daring, impulsive behaviors, indicating considerable variability in such proclivities (Willoughby et al., 2012). In addition, research has shown that parenting and other environmental factors may affect the manner in which impulsive/sensation-seeking tendencies are expressed. For instance, within affluent neighborhoods, high impulsivity or sensation seeking might lead to engagement in high-risk sports and adventuresome prosocial pursuits, whereas within less affluent neighborhoods, these same traits could give rise to delinquency, substance use, and other problems (Barker, Trentacosta, & Salekin, 2011). Thus, from the information reviewed, it appears that sensation seeking, need for stimulation, and daring monotony avoidance are observable and measurable at a very young age, and that tendencies of this type can contribute to difficulties, including physical risk to the individual and the occurrence of conduct problems.

### **Overall Psychopathy**

Aside from research demonstrating that constituent traits or facets of psychopathy can be observed and assessed at very young ages, the latest available research indicates that the condition of psychopathy as a whole is measurable in preschoolage children. For example, Colins, Andershed, and colleagues (2014) developed the 28-item Child Problematic Traits Inventory (CPTI) to assess for psychopathic traits in very young children (12 years and under). These investigators collected CPTI ratings from preschool teachers for approximately 2,000 children ages 3-5 years enrolled in community preschools in Sweden. Exploratory and confirmatory factor analyses of the CPTI's 28 items revealed three distinct but correlated dimensions, consisting of interpersonal (lying, grandiosity), affective (deficient empathy, lack of guilt), and behavioral (impulsivity, need for stimulation) dimensions. Colins, Andershed, and colleagues found that scores on all three of these dimensions were significantly associated with behavior problems (e.g., conduct problems, ADHD symptoms, and fearlessness) in their young child sample. Furthermore, the presence of concurrent elevations on all three dimensions was most strongly predictive of behavior problems, above and beyond CU traits alone, replicating findings with older youth, showing that the three dimensions together predict conduct problems better than any single dimension (Andershed, Kohler, Eno Louden, & Hinrichs, 2008; Caputo, Frick, & Brodsky, 1999; Christian, Frick, Hill, Tyler, & Frazer, 1997).

Although effort has been made in recent years to evaluate what symptomatic features are most central ("core") to psychopathy in very young individuals, data pertaining to this issue remain limited, and the previously noted finding that the three dimensions of psychopathy combine to produce the worst behavioral outcomes (e.g., Andershed et al., 2002; Christian et al., 1997; Colins, Andershed, et al., 2014; Colins, Noom, & Vanderplasschen, 2012; Vincent, Vitacco, Grisso, & Corrado, 2003) argues for the inclusion of all dimensions in youth-oriented assessments of psychopathy. Nonetheless, each dimension may have unique contributions and relate differentially to negative outcomes (Salekin, 2017). The implication is that studies of the diagnostic, trait-dispositional, behavioral, and physiological correlates of psychopathy in youth should routinely examine relationships for these distinct symptomatic dimensions, as well as overall psychopathy scores (Salekin 2016a; Salekin & Hare, 2016).

### Assessment of Psychopathy in Youth

A number of inventories have been developed for assessing psychopathy in child and adolescent samples. Three of these are direct descendants of the PCL-R: the PCL:YV (Forth, Kosson, & Hare, 1996/2003), the Antisocial Process Screening Device (APSD; Frick & Hare, 2001), and the Child Psychopathy Scale (CPS; Lynam, 1998). Other child psychopathy measures also exist, including the self-report-based Youth Psychopathic Traits Inventory (YPI; Andershed et al., 2002) and, as discussed in the preceding section, the informantrated CPTI (Colins, Andershed, et al., 2014). These five inventories, which index psychopathy in terms of distinguishable subdimensions (factors/facets), are the focus of subsections that follow. We do not review measures designed to index only one symptomatic component of psychopathy rather than psychopathic tendencies as a whole (for coverage of the best-known of these, the ICU, see Viding & Kimonis, Chapter 7, this volume).

### The PCL:YV

Forth and colleagues (1990) were the first to examine psychopathy systematically in adolescent offenders using PCL-R-based criteria (see also Chandler & Moran, 1990). Their initial study utilized a modified version of the PCL-R that excluded two items considered less applicable to adolescent-age individuals, given their limited work and relationship histories: items 9 ("parasitic lifestyle") and 17 ("many short-term marital relationships"). In addition, because adolescents have less time/opportunity for contacts with the law than adult offenders, the scoring criteria for two other items, 18 ("juvenile delinquency") and 20 ("criminal versatility"), were modified. Several studies of adolescent offenders were conducted using this modified version of the PCL-R (e.g., Sullivan & Gretton, 1996). Based on knowledge gained from these studies, and to further address issues of applicability to younger individuals, three other modifications were made. First, a scoring system that relied more heavily on involvement with peers, family, and schools was developed for the PCL:YV draft version (Forth, Kosson, & Hare, 1996/2003). Second, the two items dropped from the initial version, items 9 and 17, were reincorporated in modified form into the PCL:YV-as "parasitic orientation," reflecting reliance on others to an excessive degree vis-à-vis age expectations, and "unstable interpersonal relationships" reflecting salient problems in forming and maintaining close relationships. Third, and perhaps most important, the scoring system for the PCL:YV was further modified to accommodate enduring characteristics of youth across settings. For example, given that anger toward parents is common among adolescents and not necessarily linked to psychopathy, a youth who displays anger toward parents only, or in limited contexts, would not receive a high score on the "poor anger control" item of the PCL:YV. This revised version (Forth et al., 1996/2003) was made available to researchers for use in empirical studies and subsequently published with additional modifications as the PCL:YV. The modifications included changes in the overall descriptions of certain items (e.g., "superficial charm" was changed to "impression management"; "impersonal sexual relationships" was changed to "impersonal relationships") and adjustments to the criteria for others to improve developmental appropriateness (for further details, see Forth et al., 1996/2003).

In its current form, the PCL:YV remains a 20item inventory, with each item rated on a 3-point scale (0 = no; 1 = maybe; 2 = yes), and is intended for use with adolescents ages 13-18 years. As with the PCL-R, the items of the PCL:YV are rated on the basis of a structured interview together with collateral file information. In terms of item content, the PCL:YV provides rather comprehensive coverage of symptomatic features of psychopathy, including antisocial behavior. In parallel with findings for adult offenders (Hare, Neumann, & Mokros, Chapter 3, this volume), studies examining the structure of the PCL:YV items in adolescent samples have revealed two broad factors, which are further divisible into either three or four facets (see Forth et al., 1996/2003; Jones et al., 2006; Kosson et al., 2013; Salekin et al., 2006). The PCL:YV shows high reliability and strong criterion-related validity (Brandt, Kennedy, Patrick, & Curtin, 1997; Forth et al., 1996/2003; Hawes et al., 2014). Notably, in a study comparing differing psychopathy scales in an adolescent offender sample, Asscher and colleagues (2011) found the PCL:YV to be the best predictor of recidivism.

### The APSD

Frick and Hare (2001) developed the Psychopathy Screening Device (PSD) in the early 1990s to screen for psychopathy in childhood; the inventory's name was changed to APSD without modifications to the item content/criteria. The APSD was originally designed to be completed by informants (parents, teachers), but a self-report version was subsequently developed for use with adolescents. The specified age range is 6–13 years for the informant version, and 13–18 years for the self-report version. Items comprising each version are rated on a 3-point scale (0 = not at all true; 1 = sometimes true, and 2 = definitely true).

Like the PCL:YV, the original APSD was developed as an adaptation of the PCL-R, with items revised to be more developmentally sensitive to the concept of psychopathy in childhood; that is, to capture the expression of psychopathic tendencies in children, each of the 20 items of the PCL-R was made into an analogous item considered applicable to child-age individuals. For example, the authors formulated the item "brags a lot about abilities, accomplishments, and possessions" as a counterpart to "grandiose sense of self-worth" on the PCL-R. Other items have less clear parallels. For example, although the APSD item "unconcerned about schoolwork" was reportedly intended to index selfish-egocentric tendencies, analyses reported by Dillard and colleagues (2013) indicated that the item may correspond more closely to the PCL-R item, "irresponsibility." Furthermore, the authors' goal of including items in the APSD corresponding to each item of the PCL appears to have been only partially achieved given that some items of the latter do not have clear counterparts in the APSD (e.g., see Dillard et al. [2013] for a table comparing the items of the APSD and the PCL:YV). Moreover, there is only one APSD item that explicitly assesses antisocial behavior.

Frick and colleagues (2000) conducted a factor analysis of the informant-rated APSD using data from 1,136 elementary school-age children (M = 10.7 years) and reported evidence for alternative two- and three-factor solutions-with the former encompassing callous-unemotional (six items) and impulsive conduct problem subdimensions (10 items), and the latter encompassing interpersonal, callous, and impulsivity subdimensions (seven, six, and five items, respectively). Reliability estimates for overall scores on the informant-rated APSD have ranged from .71 to .82 (Vaughn & Howard, 2005; Kotler & McMahon, 2010). Across studies, reported reliabilities for scores on the interpersonal and impulsivity factors have generally been adequate (.52–.88), whereas reliability figures for the callousness factor have generally been lower, ranging from marginal to poor (.32–.60; Vaughn & Howard, 2005). Correspondence between teacher and parent reports has been low in differing studies (Kotler & McMahon, 2010; Vaughn & Howard, 2005). Investigations examining the factor structure of the APSD have generally found good fit for the three-factor model (Dong, Wu, & Waldman, 2014; Frick et al., 2000; Hawes et al., 2014).

Despite several limitations (i.e., generally low agreement across teachers and parents, weak reliability of scores on the callousness factor), it has been suggested that the APSD may differentiate subgroups of juvenile offenders with contrasting behavioral and physiological response patterns (for reviews, see Frick & Marsee, Chapter 19, this volume; Frick et al., 2014). Furthermore, a metaanalysis by Asscher and colleagues (2011) included coverage of some studies evaluating the effectiveness of the APSD in predicting recidivism. However, it should be noted that not all studies have replicated key findings, and further research is needed on the properties and correlates of the APSD (e.g., Colins & Andershed, 2015).

# The CPS

Lynam (1998) modeled the 13-item CPS after the PCL-R as a method for assessing psychopathy in children and adolescents (age range 6-17 years). The CPS was originally based on archival data from a large-scale study of 430 boys ages 12-13 years. Specifically, ratings of behavior and personality characteristics completed by mothers were used to index psychopathy; the rating indicators were drawn from two preexisting inventories, the Child Behavior Checklist (CBCL; Achenbach, 1991) and the Common Language Q-Sort (Caspi et al., 1992). Lynam presented evidence that a set of 41 indicators from these two inventories could be used to effectively operationalize psychopathic features corresponding to 13 of the PCL-R's 20 items.

Subsequently, a revision of the CPS was undertaken in order to (1) simplify overly complex items, (2) increase the reliability and validity of certain diagnostic features that were not optimally operationalized in the original version (i.e., glibness, shallow affect), (3) reduce overlap with explicit antisocial behavior (i.e., one item corresponding to criminal versatility was dropped), and (4) improve representation of other trait characteristics considered relevant (i.e., through addition of items indexing boredom susceptibility; see Lynam et al., 2005). This revised version of the CPS contains 55 items designed to capture the following 13 PCL-R symptom criteria: glibness, untruthfulness, boredom susceptibility, manipulation, lack of guilt, poverty of affect, callousness, parasitic lifestyle, behavioral dyscontrol, lack of planning, impulsiveness, unreliability, and failure to accept responsibility. This version of the CPS is available in caregiver and self-report forms, consisting of identical items. Each item is rated dichotomously  $(0 = no; 1 = \gamma es)$ .

A factor analysis of the original CPS by Lynam (1998) revealed a two-factor structure similar to that found for the PCL-R in adult offenders (Hare, 1991/2003); however, the two factors of the original CPS were highly intercorrelated (~.9), to a degree greatly exceeding that for the two broad PCL-R factors (~.5; Hare, 1991/2003). Despite the generally strong interrelations among items of the CPS, others have reported evidence of discriminant validity for facets of psychopathy operationalized using this inventory. For example, Salekin, Leistico, Trobst, Schrum, and Lochman (2005) formulated rationally based subscales consisting of CPS items reflecting interpersonal, affective, and impulsive features, and found that these subscales showed meaningful differential relations with trait constructs from the five-factor model (FFM) and interpersonal circumplex models of personality.

Reported reliabilities for the caregiver-rating version of the CPS have been adequate, with alphas of .73, .74, and .87 reported by Falkenbach, Poythress, and Heide (2003) for Factor 1, Factor 2, and Total scores, respectively, and values of .73, .68, .71, and .87 reported by Spain, Douglas, Poythress, and Epstein (2004) for Interpersonal (.73), Affective (.68), Behavioral (.71), and Total scores. The CPS has also been shown to effectively predict criterion measures of various types (Lynam, 1998; Lynam et al., 2005; Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007; Salekin et al., 2005; Spain et al., 2004).

# The YPI

The YPI (Andershed et al., 2002), a 50-item selfreport questionnaire, is organized into 10 subscales (five items each) and three dimensions or factors corresponding to those of the PCL-R as modeled by Cooke and Michie (2001). The three YPI dimensions are termed Grandiose Manipulative (GM), Callous–Unemotional (CU), and Impulsive–Irresponsible (II). Each YPI item is scored on a 4-point Likert-type scale ranging from 1 (*does not apply at all*) to 4 (*applies very well*). The GM dimension includes four subscales (Dishonest Charm, Grandiosity, Lying, and Manipulation), the CU dimension comprises three subscales (Callousness, Unemotionality, and Remorselessness), and the II dimension includes three subscales (Impulsiveness, Thrill Seeking, Irresponsibility). As with the APSD, reported internal consistency reliabilities for scores on the GM and II dimensions of the YPI have generally been satisfactory, with reliability for the CU dimension lower (Vahl et al., 2014). Substantial evidence exists at this point for the validity of the YPI in relation to criterion measures of various types in adolescents of both genders (e.g., Andershed, Hodgins, & Tengström, 2007; Andershed et al., 2002; Colins, Bijttebier, Broekaert, & Andershed, 2014; Colins, Vermeiren, De Bolle, & Broekaert, 2012; Hillege, Das, & de Ruiter, 2010; Poythress, Dembo, Wareham, & Greenbaum, 2006; Veen et al., 2011).

A shortened version of the YPI (YPI-S; van Baardewijk et al., 2010) consists of 18 items from the full version (six from each dimension). Several studies support the internal consistency, threefactor structure, and external validity of the YPI-S (Colins, Noom, & Vanderplasschen, 2012; Orue & Andershed, 2015; van Baardewijk et al., 2010). Vahl and colleagues (2014), who collected data for the YPI-S as part of a larger clinical protocol, provide support for its reliability and validity in applied practice. A simplified version of the YPI for use with late-childhood samples, the YPI—Child Version, is also available and has shown strong psychometric properties in existing work (e.g., van Baardewijk et al., 2008).

# The CPTI

The CPTI (Colins, Andershed, et al., 2014) was designed to index psychopathic personality traits, including grandiosity, lying, lack of empathy, lack of guilt or remorse, and impulsivity and need for stimulation in young children ages 3-12. The CPTI consists of 28 items that are rated by the preschool, kindergarten, or grade school teacher of a child, each on a 4-point scale (1 = does not apply at all; 2 = does not apply well; 3 = applies fairly well; and 4 = applies very well). The CPTI was developed with a theory-driven approach, with items formulated specifically to assess psychopathy in terms of the three dimensions (Interpersonal, Affective, Impulsive–Behavioral) found to underlie the PCL-R and its affiliates.

As noted earlier, the original CPTI development study (N = 2,000) reported adequate fit for a

three-factor structural model of the inventory's 28 items, reflecting thematic dimensions of Grandiose-Deceitful, Callous-Unemotional, and Impulsive-Need for Stimulation. Scales indexing these three factors showed high internal consistency, and each showed significant associations with conduct problems, fearlessness, difficult temperament, and ADHD symptoms. As expected, based on psychopathy theory and research, it was the confluence of the three CPTI dimensions (i.e., the presence of elevations on all three) that exhibited the strongest predictive relationship with conduct problems-exceeding that for any single dimension (Colins, Andershed, et al., 2014). Since this original study, the CPTI and its factor structure, internal consistency, and external validity have been further supported in three additional independent samples of children (Colins, Andershed, Fanti, & Larsson, 2017; Colins, Veen, Veenstra, Frogner, & Andershed, 2016; Somma, Andershed, Borroni, & Fossati, 2016), one of them including a parent-rated version (Somma et al., 2016).

### **Comparisons of Measures**

A number of review articles and chapters have summarized results from cross-sectional studies examining concurrent relations of several of the previously noted youth psychopathy measures with criteria of various types (e.g., Edens et al., 2001; Kotler & McMahon, 2010; Vaughn & Howard, 2005). Some critical points emerging from these reviews are worth noting here. First, correlations between different raters on the same measure, and between different measures, range from quite low (nonsignificant) to moderate. These low correlations are problematic for understanding what differing psychopathy measures tap, and, to some extent, for integrating findings across measures. Second, efforts toward constructing measures that are developmentally sensitive have been minimal, and it remains to be determined whether existing measures can be further refined by inclusion of even more developmentally sensitive items. For instance, there may be additional/improved ways to tap key traits (e.g., "superficial charm," "irresponsible behavior," "parasitic tendencies") in children and adolescents. Third, few efforts to generate gender-specific items have been undertaken, despite evidence suggesting that alternative item indicators may be needed to optimize assessment of psychopathy in female samples (Verona & Vitale, Chapter 21, this volume). Fourth, although advances have been made in understanding the stability of psychopathy across time and developmental periods, much of the existing work on this topic is based on measures of psychopathy derived after the fact from assessment protocols designed for broader purposes, such as those of the Avon and Pittsburgh longitudinal studies (e.g., Barker, Oliver, et al., 2011; Pardini, Obradović, & Loeber, 2006). Although these studies have provided key information regarding psychopathy, further research with scales specifically designed to assess psychopathy would provide a valuable addition to this important research.

In addition to the foregoing issues, few studies to date have examined the item functioning of individual youth psychopathy measures, or evaluated how clinician- and self-report-based measures compare in terms of item functioning. One such study by Dillard and colleagues (2013) used IRT to test the applicability of items from the APSD-SR and the PCL:YV to a sample of legally involved adolescent boys and girls. These authors found the PCL:YV to be particularly effective for assessing interpersonal and affective features of psychopathy, but less effective for indexing lifestyle and antisocial features. The APSD Self-Report Version (APSD-SR), on the other hand, was found to be highly effective for assessing interpersonal and impulsivity traits, but less so for indexing affective (CU) traits. Findings from this work may help to explain the modest interrelations among differing youth measures, and, in conjunction with aforementioned evidence for the weak reliability of APSD-CU scores, raise concerns about widespread reliance on the APSD for indexing CU traits-which, as noted, served as the major referent for the LPE specifier in DSM-5.

# Key Issues in Conceptualizing and Assessing Psychopathy in Youth

Given the increasing emphasis on the construct of psychopathy in research directed at understanding conduct problems in youth, further systematic effort should be devoted to addressing other key issues pertaining to how psychopathic tendencies manifest in children and adolescents, including temporal stability, cognitive and emotional correlates, biological indicators, and utility for clinical management and prediction purposes. It will be critical for researchers to examine these variables across the aforementioned subdomains (facets) of psychopathy, utilizing measures that effectively tap each subdomain.

# Temporal Stability of Psychopathy in Children and Adolescents

A number of research studies have been conducted with child and adolescent samples to examine the stability of psychopathy, or components of psychopathy (Barry, Barry, Deming, & Lochman, 2008; Loeber et al., 2009; Muñoz & Frick, 2007; Pardini, Lochman, & Powell, 2007; van Baardewijk, Vermeiren, Stegge, & Doreleijers, 2011). An early study by Frick, Kimonis, Dandreaux, and Farell (2003) examined temporal stability of APSD-assessed psychopathy over 4 years in a nonreferred child sample. For parent ratings of overall psychopathic traits, stability estimates using intraclass correlation coefficients (ICCs) ranged from .80 to .88 across 2–4 years, with a stability estimate of .93 across all four assessment points. Stabilities for individual subscales of the parent-rated APSD (Interpersonal, Callous-Unemotional, Impulsivity) were also quite high across the differing assessments, ranging from .71 to .92. Predictors of score stability across time included family socioeconomic status, quality of parenting, and the child's level of conduct problems at earlier ages.

Obradović, Pardini, Long, and Loeber (2007) examined temporal stability of parent-rated psychopathic features with a major focus on the interpersonal dimension of psychopathy in 503 firstgrade (6-year-old) boys from the Pittsburgh Youth Study. Although the title of the article refers to "longitudinal invariance of callousness" and the term "callousness" is used throughout the text, the scale used in this study was labeled Interpersonal Callousness (IC) and consisted largely of interpersonal (arrogant-manipulative) items (i.e., "is a smooth talker," "exaggerates," "acts sneakily," "manipulates others," "cannot trust what he says," "does not keep promises," "denies wrongdoing"), along with one item corresponding to a PCL-R affective item (i.e., "lacks guilt")-and a CFA of the item set confirmed a single dominant factor to the scale. Stability estimates for this interpersonal factor based on parent ratings were .77 from the initial assessment point to 2 years after (ages 9 and 10), .66 after 4 years (age 12), and .50 after nine years (age 16). These estimates are comparable to some of the highest stability estimates in personality research.

Also, using participants from the Pittsburgh Youth Study sample (N = 250), Lynam and colleagues (2007) found that self-reported psychopathic traits at age 13 significantly predicted clinician ratings of psychopathic traits at age 24 (r for overall PCL-R scores = .31; r's for Interpersonal, Affective, Impulsive, and Antisocial factors = .19, .15, .28, and .33, respectively). Notably, children scoring within the upper 10% of the sample on psychopathic traits at age 13 were 3.22 times more likely than other children to show elevations on the adult measure 11 years later, but most children in the sample showed a decline in psychopathic traits over time. These findings indicate that while psychopathy is somewhat stable from adolescence to early adulthood, it is by no means invariant across this period, given that only 9% of the variance in age 24 scores was accounted for by scores at age 13. However, a factor contributing to the more modest stability estimates in this study could be the difference in assessment methods used at earlier (self-report) versus later ages (clinician-rating; cf. Blonigen et al., 2010).

Elsewhere, Barker, Oliver, and colleagues (2011) investigated relationships among prenatal risk factors, fearless/boldness (interpersonal style) at age 2 years, and psychopathic tendencies at age 14, as indexed by a mix of interpersonal and affective items (i.e., makes a good impression [reverse]), keeps promises [reverse]), cold blooded and callous, shallow and fast changing emotions, genuine expression of emotion [reverse]), and genuinely sorry if hurts someone [reverse]). Barker and colleagues found that elevations in fearlessness at age 2 predicted increased psychopathy scores, along with greater conduct problems 12 years later. Additionally, in follow-back analyses, these authors found that fearless youth exhibiting IC tendencies along with conduct problems (CP) at age 14 showed more early family risk factors than nonfearless youth exhibiting either IC or CP tendencies alone at age 14 years. For example, the combination of IC and CP tended to be associated with higher levels of maternal psychopathology, harsh parenting, and low maternal warmth. Consistent with this, a prospective study by Waller and colleagues (2012) noted that exposure to harsh parenting involving physical and verbal punishment at age 2 predicted increased psychopathy tendencies at subsequent ages 3 and 4. This predictive association was maintained even after controlling for IC traits at the initial assessment point (age 2).

Most recently, Hawes and colleagues (2014) examined the temporal stability of psychopathy using data from a large male adolescent sample (N = 1,170) assessed annually over a 7-year period encompassing the transition from adolescence to young adulthood (ages 17–24 years). The PCL:YV was used for the initial baseline assessment, and

the YPI-S for the follow-up assessments. Internal consistency estimates for the different assessment points were higher for the Interpersonal and Impulsive scales than the CU scale. Autocorrelations were used to index temporal stability, and showed moderate to large magnitudes across successive 1-year periods for total YPI-S scores (.50-.59) and also for Interpersonal (.49-.58), CU (.39-.53), and Impulsive dimension scores (.48-.56). These authors also examined convergent and discriminant validity of psychopathy scores at the time 1 assessment point. With respect to FFM personality traits, the PCL:YV Interpersonal dimension was found to be negatively correlated with Neuroticism and Agreeableness, and positively correlated with Extraversion, Openness, and Conscientiousness. By contrast, the PCL:YV affective (CU) dimension showed a small positive association with Neuroticism and significant negative correlations with the other four FFM trait domains, and the PCL:YV Impulsivity dimension showed negative correlations with Agreeableness and Conscientiousness and a positive association with the Neuroticism scale. These results demonstrate good convergent and discriminant validity for the Interpersonal and possibly the Impulsivity subscales of the PCL:YV, but weaker convergent and discriminant relations for the PCL:YV affective (CU) scale.

Some additional perspective on the stability of psychopathic traits is provided by data from genetically informed longitudinal studies (for a review of findings from behavior genetic research on psychopathy as whole, see Waldman, Rhee, Lo-Paro, & Park, Chapter 14, this volume). Forsman, Lichtenstein, Andershed, and Larsson (2008) examined the role of genetic influences in the stability of psychopathic personality as indexed by the YPI. These authors found a strong contribution of genetic influences to the stability of psychopathy as a whole from ages 16-19, as evidenced by higher cross-twin stability of YPI total scores among monozygotic twins (r = .31 for both boys and girls, p's < .05) than among dizygotic twins (r's = .05 and .15, respectively, p's = ns). With regard to the lower-order YPI dimensions, the authors found evidence for a contribution of unique genetic influences (i.e., distinct from those contributing to scores on the YPI as a whole) to scores on the CU and Impulsivity dimensions, but not the Interpersonal dimension. Notably, as reported in prior work (Larsson, Andershed, & Lichtenstein, 2006), scores for the three YPI dimensions in this sample were found to load on a common higher-order factor-on which the Interpersonal dimension loaded to a markedly larger degree at ages 16 and 19 (loadings = .77 and .76, respectively) than did the CU (.32 and .32) and Impulsivity dimensions (.46 and .39). Thus, it is quite possible that the high genetic stability for YPI total scores was substantially attributable to interpersonal traits that saturated the inventory as a whole.

In summary, research on the temporal stability of child and adolescent psychopathy has demonstrated some degree of stability in psychopathic tendencies from early to later childhood and adolescence, and from adolescence through to adulthood. Findings of significant temporal stability coincide with evidence that genetic influences account for a sizable portion of the variance in psychopathy scores (i.e., ranging from 40 to 65%; Waldman et al., Chapter 14, this volume). However, available stability estimates have been generated primarily from studies using the APSD or after-the-fact indices of psychopathy created for use in existing datasets. As such, there is a need for further longitudinal research examining the temporal stability of psychopathy as indexed by other established youth measures, including the PCL:YV, CPS, CPTI, and YPI.

### **Cognitive and Emotional Correlates**

An extensive body of research points to impairments in emotional reactivity and response inhibition/modulation in adult psychopathic individuals (e.g., see Hamilton & Newman, Chapter 4, and Patrick, Chapter 18, this volume). The available research on children and adolescents with psychopathic traits also indicates that they may differ from other youth in their cognitive and emotional functioning. However, the observed cognitive and emotional processing differences may depend in part on the dimension of psychopathy or configuration of psychopathic features being examined. For instance, Salekin and colleagues (2004) found that the interpersonal factor of psychopathy was positively associated with intelligence, whereas the affective factor was negatively associated with intelligence. In another study focusing on 6- to 9-year-old children recruited from elementary schools and community health agencies (N = 221), McKenzie and Lee (2014) found that interpersonal features of psychopathy, but not callous traits, uniquely and positively predicted parentand teacher-rated ODD and CD symptoms. They also reported a significant IQ × interpersonal features interaction whereby interpersonal features (grandiose-manipulative traits) of psychopathy were more strongly associated with ODD and CD among children with high IQs relative to children with average and low IQs. These data suggest that interpersonal traits may well be a critical feature of psychopathy that, in conjunction with high IQ, may constitute a unique profile associated with emergent conduct problems.

Other researchers have found that youth with psychopathic features are less impaired in their verbal abilities (e.g., Brandt et al., 1997; Loney et al., 1998; Salekin et al., 2004), and show greater flexibility in developing solutions to social problem-solving tasks (Waschbusch, Walsh, Andrade, King, & Carrey, 2007) than youth with CD alone. However, not all studies have shown such effects. Variation in findings may reflect differences in methods for assessing psychopathy across studies, perhaps especially in the types of items used to index interpersonal features, such as superficial charm, glibness, and manipulation, that may relate most positively to verbal fluency and problemsolving ability.

Another focus of research with child and adolescent samples has been on processing of reward and punishment cues. Given the evidence for abnormalities in the processing of such cues among high-psychopathy adults (Patrick, Chapter 1, this volume), findings for youthful samples has been less consistent than might be expected. For example, in a review article, Byrd, Loeber, and Pardini (2014) identified two studies that examined risk-taking behavior in young individuals as a function of overall psychopathic features, both of which reported positive associations (Blair, Colledge, Murray, and Mitchell, 2001; Fairchild et al., 2009). However, two other studies that examined CU features alone found no association with elevated risk taking. In one of these (Marini & Stickle, 2010), CU traits were associated with less risk taking after the authors controlled for interpersonal and impulsive features of psychopathy. In the other (Centifanti & Modecki, 2013), participants high in CU traits showed reduced risk taking following receipt of reward and, in the presence of peers, faster responding following receipt of punishment.

Another reward–punishment task that has been used extensively in the adult psychopathy literature is the passive avoidance learning paradigm (for a description, see Hamilton & Newman, Chapter 4, this volume). Three studies to date have examined responses of antisocial youth with psychopathic features in tasks of this type. Newman, Widom, and Nathan (1985) examined performance in mixed reward-punishment, reward-only, and punishment-only conditions in a sample of clinically referred youth. Youth high in psychopathy and low in anxiety committed more passive avoidance errors in the mixed-incentive condition than either high-psychopathic/highanxious youth or low-psychopathic/low-anxious youth. Notably, however, no group differences were found in the reward-only or punishment-only conditions. Likewise, in another study, Vitale and colleagues (2005) found that high-psychopathic/ low-anxious youth committed more passive avoidance errors than low-psychopathy/low anxious youth in a mixed reward-punishment condition. By contrast, Scerbo and colleagues (1990) found no significant difference in passive avoidance errors within a mixed-incentive condition for youth scoring high versus low in psychopathic traits. Instead, these authors found that high-psychopathy youth committed fewer omission errors and responded to more reward stimuli relative to lowpsychopathy youth.

Another type of reward–punishment learning procedure that has been used with youth samples is the response reversal task, in which the probability of reward versus punishment outcomes varies across the task, requiring participants to adjust their performance as contingencies change. In a typical design, participants begin with a 90% probability of receiving a reward (e.g., money) and a 10% chance of receiving punishment (e.g., loss of money). After, for example, 10 new stimuli, the probability is adjusted by 10%, until there is a 0% probability of reward and a 100% probability of punishment. Participants are instructed that they can discontinue playing the game at any time and collect the money they have accumulated, with poor performance reflecting a greater number of played stimuli.

In a version of this task involving progressive reductions across trials in the probability of reward outcomes, Fisher and Blair (1998) found that high-psychopathic youth showed poorer performance (as indexed by greater persistence in performance the task) relative to low-psychopathic youth. When continuous psychopathy subscale scores (CU, Impulsive/CD) were examined as concurrent predictors of poorer performance in a regression model, only the associations for the Impulsive/CD symptom subscale emerged as significant. This finding concurs with findings from a more recent study by Muñoz and Anastassiou-Hadjicharalambous (2011), demonstrating an association between behavioral impulsivity and a reward-dominant response style. By contrast, Frick, Cornell, Barry, Bodin, and Dane (2003) found scores on the CU of the APSD to be most predictive of failure to inhibit a dominant response set. However, in a somewhat earlier study, O'Brien and Frick (1996) found only weak, nonsignificant associations between psychopathy facet scores and reward-dominant responding (*r*'s for Interpersonal, Affective, and Impulsivity facets = -.08, .11, and .00, respectively).

In another study of this type, Budhani and Blair (2005) used varying contingencies for reward versus punishment, ranging from 100:0 to 70:30, with reversal occurring once participants learned which stimulus was rewarded. These authors found that high-psychopathy youth committed more errors following contingency reversals than low-psychopathy youth. However, within the 70:30 contingency condition, a greater proportion of high-psychopathy participants failed initially to learn which stimulus resulted most often in reward. This may indicate that youth high in psychopathic traits not only have problems adjusting to contingency changes but also have difficulties in initial learning under conditions in which the probability of reward versus punishment is less clear. There is also the possibility of motivational issues. Given these mixed findings, it will be important to conduct further studies to clarify whether performance deficits in such tasks reflect punishment insensitivity or difficulties modulating attention in the presence of competing reward-punishment cues, and to establish which facet(s) of psychopathy (interpersonal, affective, impulsive) account most for the observed deficits.

Another body of work indicates that children and adolescents high in psychopathy are impaired in recognizing and responding to affective expressions of other people. For instance, studies by Blair and colleagues have revealed deficits among psychopathic youth (as defined by high overall scores on the APSD) in the processing of sad and fearful facial expressions and vocal tones in others (Blair, Budhani, Colledge, & Scott, 2005; Blair, Monson, & Fredrickson, 2001). In follow-up work, Dadds, El Masry, Wimalaweera, and Guastella (2008) demonstrated that reduced attentiveness to the eye region in particular may account for deficient fearface recognition in high-psychopathic youthand interpreted this finding as consistent with the hypothesis of amygdala dysfunction underlying affective-interpersonal features of psychopathy (Blair, Meffert, Hwang, & White, Chapter 17, this volume).

However, the facial-affect recognition paradigm has not always generated consistent findings. For instance, Woodworth and Waschbusch (2008) reported that children with psychopathic traits were actually better at recognizing fear expressions. Other work suggests that the impairment may extend to affective expressions of other types rather than being specific to fearful or sad faces (e.g., see review by Dawel, O'Kearney, McKone, & Palermo, 2012). Furthermore, the fact that many studies of facial-affect recognition in high-psychopathy vouth show only small to negligible effects (r's < .10; Wilson, Juodis, & Porter, 2011) points to heterogeneity within psychopathic groups, and further highlights the importance of examining effects for distinct facets of psychopathy.

One other experimental approach, the affective lexical decision task (Williamson, Harpur, & Hare, 1991), warrants mention given its use in a number of adult psychopathy studies. This task assesses recognition times for emotional (positive, negative) versus nonemotional words under instructions to identify whether a visual character string is a word or a nonword. Loney, Frick, Clements, Ellis, and Kerlin (2003) examined emotional reactivity in adolescents referred for antisocial behavior problems using this task and, consistent with findings for adult psychopathic participants, found that CU traits as indexed by the APSD (when controlling for elevations in impulsive conduct problems) were associated with slower reaction times for negative words in particular. By contrast, the authors discovered that problems of impulse control (controlling in this case for elevations in CU traits) were associated with *faster* recognition time for negative emotional words. The authors posited that differing patterns of emotional reactivity may characterize distinct subgroups of youth with antisocial behavior problems (i.e., those with and without salient CU traits). Consistent with these results, various studies have reported deficits in empathy and moral reasoning among adolescents high in overall psychopathy (i.e., elevated on affectiveinterpersonal as well as impulsive-antisocial features) as assessed by the PCL:YV (Chandler & Moran, 1990; Trevethan & Walker, 1989) and the APSD (Blair, Monson, & Frederickson, 2001).

The foregoing results provide some evidence for differences in the processing and use of semantic and affective information in children and adolescents diagnosed with psychopathic personality. A particular question of importance is whether deficits in cognitive and emotional processing are apparent from an early age, or instead emerge over time as children or adolescents with conduct problems experience adverse outcomes such as alcohol or drug dependency, job loss, impaired social relations, and incarceration. Findings pertaining to biological indicators of psychopathy in youthful samples, considered next, provide some perspective on this question.

### **Biological Indicators**

There is a growing body of research on the biological correlates of psychopathy in young participant samples. For instance, two studies (Anastassiou-Hadjicharalambous & Warden, 2008; de Wied, van Boxtel, Matthys, & Meeus, 2012) have reported that youth high in psychopathic traits (in some studies, CU traits alone) along with conduct problems showed reduced heart rate reactivity in response to emotionally evocative films compared to low psychopathic or low-CU youth with conduct problems. Other work has shown that high-psychopathy adolescents exhibit reduced skin conductance reactivity (SCR) when anticipating aversive stimuli (Fung et al., 2005; Isen et al., 2010) and abnormal brain potential response during performance of simple tasks (e.g., reduced oddball-P3 response; Gao, Raine, Venables, Dawson, & Mednick, 2010) and when viewing depictions of others in pain (Cheng, Hung, & Decety, 2012). However, the SCR reductions reported by Fung and colleagues (2005) appeared to be associated more with variations in general delinquency than with hallmark psychopathic traits. Other studies with clinical youth samples have found psychopathic traits to be associated with reduced SCR in response to peer provocation (Kimonis et al., 2008) and blunted cortisol reactivity in response to experimentally induced stress (Stadler et al., 2011), although the latter of these studies only examined CU traits and not interpersonal or impulsive facets of psychopathy—and other work has reported increased rather than reduced cortisol reactivity to stress in relation to CU traits (Mills-Koonce et al., 2015).

There is also a growing body of data from brain imaging studies of high-psychopathy youth. Studies of this kind to date have shown that young participants with psychopathic traits exhibit reduced right amygdala activation in response to fearful faces (Jones, Laurens, Herba, Barker, & Viding, 2009; White et al., 2012) and when performing an affective theory of mind task (Sebastian et al., 2012). Finger and colleagues (2012) presented evidence for reduced amygdala–prefrontal functional connectivity in youth high in psychopathic traits of (as indexed by PCL:YV total scores), along with normalized the problems (ODD or CD) relative to nonclinical (healthy) controls. Notably, the design of this study (like that of some others; e.g., Jones et al., 2009) did not permit effects for CU tendencies a to be separated from those for impulsive deviancy. If the ventromedial prefrontal cortex during puntished reversal errors in youth exhibiting callous tendencies coupled with conduct problems relative pt to both healthy controls and youth with ADHD. The mathematical prefrontal reduced covariation be-

tween level of punishment administered to a coparticipant and degree of activity in limbic brain regions (dorsal anterior cingulate cortex, anterior insula) for nonclinical youth (ages 11–17) scoring higher versus lower in CU tendencies as indexed by the ICU.

Rijsdijk and colleagues (2010) identified anatomical variations in specific brain regions as potential endophenotypes (i.e., genetically based indicators) for psychopathy in a sample of boys ages 10-13 years. Psychopathic tendencies were indexed in terms of CU symptoms combined with conduct problems. These investigators reported that left posterior cingulate and right dorsal anterior cingulate gray-matter concentrations showed significant heritability (.46 and .37, respectively) and significant associations with psychopathic traits, and that common genetic influences accounted for the association between brain structure and symptomatology. These data suggest that the genetic contribution of psychopathic traits might manifest through an impact on anterior and posterior cingulate cortex development. However, given the exploratory nature of this work, replication is required before firm conclusions can be advanced.

As discussed by Waldman and colleagues (Chapter 14, this volume), a small number of studies have tested for distinct genetic polymorphisms associated with psychopathic tendencies (or CU traits as a distinct component of psychopathy) in youthful samples. Viding and colleagues (2010) documented several potential autosomal singlenucleotide polymorphisms that may play a role in the development of psychopathic traits, and two other studies (Fowler et al., 2009; Hirata, Zai, Nowrouzi, Beitchman, & Kennedy, 2013) reported associations for two catechol-O-methyltransferase (COMT) polymorphisms. Elsewhere, in a sample of 162 children and adolescents ages 6–16, Beitchman and colleagues (2012) found psychopathic traits to be associated with two polymorphisms of the oxytocin receptor (*OSTR*) gene. However, given the limited number of such studies to date, and general concerns that have been raised regarding the replicability of findings from candidate gene studies (Iacono, Vaidyanathan, Vrieze, & Malone, 2014), there is insufficient information to draw stable conclusions.

In summary, research thus far has yielded promising evidence for distinct biological indicators of psychopathic traits in youth that may relate to reported cognitive and emotional deficits, and perhaps to variations in genes that influence neural structure and function. However, available data remain limited, particularly in the brain imaging and molecular genetic areas; thus, further research is needed to replicate and extend existing work.

# **Clinical and Predictive Utility**

Two important considerations regarding the applicability of the psychopathy concept to children and adolescents are assessment of future risk and prediction of amenability to psychological therapy. These considerations can be posed as clinical applied questions: (1) Is psychopathy an effective predictor of antisocial behavior and misconduct in youth, as it has been found to be in adults (Douglas, Vincent, & Edens, Chapter 28, this volume)?, and (2) Does psychopathy affect an individual's likelihood of benefiting from treatment? In the next two subsections, we review findings pertaining to these questions.

# Antisocial Deviance and Aggression

A notable aspect of psychopathy is its relationship to violent and nonviolent criminal behavior (see Douglas et al., Chapter 28, and Porter, Woodworth, & Black, Chapter 25, this volume). A considerable number of studies have examined relations between psychopathy and antisocial behavior in children. Consistent with the adult literature, adolescents with high scores on the PCL:YV engage in more antisocial behavior than do low scorers, both in institutions and in the community, and also commit additional serious antisocial acts—specifically, more violent offenses (Leistico, Salekin, DeCoster, & Rogers, 2008; Salekin, Rogers, & Sewell, 1996). In a meta-analysis of existing research, Leistico and colleagues (2008) found that psychopathy showed a magnitude of association with violent crime in adolescents (d = 0.54) similar to that for adults (d = 0.57), but a slightly lower association with nonviolent recidivism (d= 0.40) than for adults (d = 0.55). On average, adolescent reoffenders scored about one-half of a standard deviation higher on the PCL than did refrainers. A similar magnitude of effect was found for institutional infractions (d = 0.60), again paralleling findings with adults (d = 0.58).

The predictive validity of the PCL:YV with respect to serious antisocial behavior is evident over periods ranging from 1 to 10 years (e.g., Corrado, Vincent, Hart, & Cohen, 2004; Forth et al., 1990; Gretton, Hare, & Catchpole, 2004; Ribeiro da Silva, Rijo, & Salekin, 2012; Toupin, Mercier, Dery, Cote, & Hodgins, 1996). The data from available studies show a similar magnitude of effect for PCL Factors 1 and 2 in predicting violent offending and institutional infractions among adolescent offenders. However, for general recidivism, Factor 2 appears to be more predictive. Although the bulk of research on the association between psychopathy and antisocial behavior has been conducted with the PCL-R and PCL:YV, the APSD has produced similar results in some studies (see Asscher et al., 2011; Frick, Stickle, Dandreaux, Farell, & Kimonis, 2005), although the one existing meta-analytic study that examined the APSD in relation to other youth psychopathy measures (Asscher et al., 2011) found the PCL:YV to be the best predictive tool.

### Psychopathy and Response to Treatment

To date, research evaluating the effectiveness of treatment for psychopathy in youth has yielded some positive results (Salekin, 2002; Salekin, Worley, & Grimes, 2010). Caldwell, Skeem, Salekin, and Van Rybroeck (2006) examined the effects of an intensive behaviorally oriented intervention on young offenders in a secure facility. These authors found that treatment of youth with psychopathic features resulted in slower and lower rates of serious recidivism. Hawes and Dadds (2005) examined the impact of a parent training intervention on the expression of CU traits in 4- to 8-year-old boys referred to clinics for conduct problems, and found a significant reduction over the course of treatment. Kolko and colleagues (2009) evaluated effects of a modularized treatment administered in either a community or a clinic setting on the behavior of 6- to 11-year-old boys and girls (N = 139) diagnosed with ODD or CD. Findings indicated a decrease in both interpersonal and callous features of psychopathy as a function of the treatment that persisted over a 3-year period. Consistent with this, Salekin, Tippey, and Allen (2012) reported that youthful offenders high in psychopathy and CD symptoms showed reductions in psychopathic tendencies in response to a novel "mental models" treatment program that included a neurobiological didactic component (i.e., information about brain development, structure, and function), along with positive psychological exercise and prosocial planning components. Other studies have likewise demonstrated some beneficial effects of treatment with interpersonally callous individuals (McDonald, Dodson, Rosenfield, & Jouriles, 2011; Roche, Shoss, Pincus, & Menard, 2011; Salekin, Rogers, & Machin, 2001; see also Haas et al., 2011).

# **Recommendations for Science** and Practice

Our review of the youth psychopathy literature indicates that the interpersonal, affective, and behavioral features of psychopathy are present and measurable quite early in life. In addition, available reliability and validity data indicate that the multidimensional psychopathy measures developed for use with children and adolescents do, for the most part, index a condition that appears similar to adult psychopathy, and that psychopathic tendencies identified early in life have a genetic basis and are relatively persistent across time. At the same time, our review highlights mixed findings regarding cognitive and emotional impairments in high-psychopathy youth, and the need for further systematic research on neurobiological correlates of psychopathy in younger samples to complement work of this type done with adults. Finally, available research indicates that psychopathic tendencies in youth are predictive of more severe antisocial-aggressive outcomes, but that psychological treatment has potential to ameliorate the condition early in its development.

There are also distinct points of concern highlighted by our review pertaining to areas in which investigative effort is specifically needed to move our understanding of child and adolescent psychopathy forward. In the brief sections that follow, we delineate what we see to be the main priorities for future research in this area—discussing along the way how representation of psychopathy can be further improved in official diagnostic manuals (i.e., the DSM and ICD).

# *Psychopathy as a Broad Construct with Component Parts*

Findings from this review indicate that it will be important in future research on youth psychopathy to frequently report findings for psychopathy total scores along with its facets. This will provide for more systematic delineation of deficits or deviations associated with one particular facet, versus those associated with another, versus those associated with the conjunction of certain facets or psychopathic tendencies as a whole. Importantly, this approach will also allow for identification of instances in which a high score on one facet of psychopathy masks (i.e., suppresses) deficits specific to another facet. This may be key to better understanding the "mask of sanity" (see Patrick, 2010; Salekin, 2017).

This review also points to the need to be more specific regarding the labeling of facet subscales and tethering labels more directly to the items used to index symptom components. For example, in some studies the term "callous-unemotional traits" has been used for scales that consist mainly of interpersonal items, or that contain some combination of interpersonal and affective items (see Barker, Oliver, et al., 2011; Cheng et al., 2012; Obradović et al., 2007; O'Brien & Frick, 1996). Studies utilizing data from the Pittsburgh Youth Study longitudinal sample have yielded novel and important insights into psychopathy, but this work may be most informative about interpersonal (grandiose-manipulative) features of psychopathy more so than CU traits (i.e., since seven of eight items used to index psychopathic traits reflect interpersonal features). Another problematic practice has been to label youth subgroups as "high versus low CU" when overall psychopathy scores were used to subdivide participants. To address this issue, researchers should make it clear when they are presenting findings for the broad concept of psychopathy (i.e., as indexed by total scores) versus narrower facets, and when reporting results for facet scores, and be more precise in labeling subscales.

In addition, we recommend that researchers focus more on investigating combinations or interactions among the facets of psychopathy in terms of relations with conceptually informative criterion variables and predicting clinically important outcomes, including severe, life-threatening behaviors (e.g., explosive physical violence, substance abuse, suicide attempts), as well as treatment needs and outcomes. Directing greater attention to configurations of symptom facets and potential interactions among them will, for example, help in clarifying whether it is sufficient to use CU traits (e.g., as indexed by the CU subscale of the APSD, the self-report-based ICU, or the DSM-5 LPE specifier) in identifying a clinically meaningful subgroup of young individuals with problem behavior. In addition, this methodology will allow for the determination of whether other combinations identify meaningful groups (Grandiose-Manipulative plus CD and Daring Impulsive plus CD). In this regard, person-oriented statistical methods such as cluster analysis (Hare, Neumann, & Mokros, Chapter 3, this volume) and latent class analysis (e.g., Vaidyanathan, Patrick, & Iacono, 2011) may provide an effective complement to dimensional analytic approaches for identifying configurations (i.e., profiles) of psychopathy facets that occur at higher rates than others and may show distinct experimental and clinical correlates.

As research moves forward on child psychopathy, it will be important to also keep in mind that individuals high in psychopathy, including youthful individuals, may present with comorbid conditions such as substance abuse, mood problems, and head injuries that, if not controlled, cloud interpretation of findings. Extent of justice system contact and incarceration history is another variable that tends to vary systematically with psychopathy level and may moderate research effects of interest. More studies are needed that assess and control for potential confounds of these types, either statistically, or through use of comparison groups.

# What Is the "Core" of Psychopathy?

The affective facet has often been assumed to be the core of psychopathy in the recent surge of child studies, but it should be noted that this is without clear empirical support and it lacks a clear definition of the concept core. Studies showing that CU traits synergize with CD symptoms to predict more persistent and severe antisocial behavior problems (e.g., Christian et al., 1997; Frick, Cornell, Barry, Bodin, & Dane, 2003) have been used to argue that the affective-CU facet is the core of psychopathy. However, some studies have shown the interpersonal facet to be more strongly related to problem behavior than the other facets (e.g., McKenzie & Lee, 2014), and other studies (as noted earlier) have attributed predictive effects for scales consisting mainly of grandiose manipulations or daring impulsive items rather than affective-CU features. Interestingly, the study by Christian and colleagues (1997) showed that the entire syndrome of psychopathy evidenced the most problems, more so than individual facets, or individual facets linked with CD.

In confronting this issue, it is important to consider what is meant by the term "core." A definition that captures its usage in the psychopathy literature is that the core comprises the root of a problem, from which branches of symptoms such as problematic traits and behaviors will develop, in interaction with the social environment. This definition implies that the core traits of psychopathy will be the first to emerge, with ancillary traits and behaviors then developing as outcomes of the core traits in conjunction with social-environmental influences (e.g., parenting, peers, schooling). This perspective on the term "core," as applied to psychopathy, would imply that very early appearing, perhaps to a large extent genetically and biologically determined traits represent the root liability for psychopathy. However, as can be seen in this review, it is too early to make any assumptions as to which traits are core. It may be that an inborn confident, arrogant, and superior personality style leads to low remorse and potentially active antagonism ("meanness") toward others.

The "core debate" may be important because knowledge about what lies at the core for each independent youth may be necessary for formulating effective prevention programs. On the one hand, if we know what the root of the problem is for an individual youth, not merely the branches and symptoms of it, we can potentially devise and direct interventions to the root of the problem, and perhaps block its emergence, or at least reshape its expression in directions other than manipulation, exploitativeness, aggression, and criminal deviance more broadly.

On the other hand, it will be important to consider the possibility that multiple etiological factors or processes may underlie psychopathy, and that more specific liabilities might contribute to distinct symptomatic subdimensions (facets) of psychopathy. From this standpoint, it will be important for ongoing studies of biobehavioral correlates and etiological mechanisms to examine relationships for psychopathy facets and combinations of facets, as well as for total psychopathy scores (Salekin & Hare, 2016).

### DSM-5, ICD-11, and Beyond

In pursuing research on youth psychopathy, it is imperative that researchers strive for greater clarity both in the concepts and measures they employ and in the aims of their research endeavors. This point is made salient by changes in DSM-5 and the upcoming 11th version of the ICD (to be published in 2018), which have formally reintroduced psychopathy into the official diagnostic nosology-following many years of emphasis on generic antisocial behavior conditions (i.e., CD, antisocial personality disorder). While the addition of the LPE specifier to the diagnosis of CD in DSM-5 is clearly an important step forward, it entails many limitations. We believe it will be important to augment this specifier with additional features of psychopathy in future revisions and editions of the DSM and ICD (Salekin, 2016, 2017). Lahey (2014), for example, raised several concerns about the LPE specifier (e.g., limited existing database for the specifier as it appears in DSM-5) and questioned whether the items of the specifier are sufficiently correlated with one another to demarcate a coherent affective-CU subdimension (see, e.g., Kahn, Frick, Youngstrom, Findling, & Youngstrom, 2012) reflecting "a unitary psychobiological process" (Lahey, 2014, p. 59). And, in this chapter, we have noted the mislabeling of "CU" scale measures in many youth psychopathy studies. As we noted in preceding subsections, interpersonal characteristics and daring tendencies may also be important to consider in delineating a psychopathic variant of CD.

Drawing on various lines of evidence highlighted in this review, our recommendation is that future DSM and ICD editions consider the inclusion of specifiers for three "psychopathic" variants of CD, as opposed to only one (i.e., LPE) variant:

- 1. Grandiose-manipulative (i.e., GM traits; exhibiting salient interpersonal features of psychopathy).
- 2. Callous-unemotional (i.e., CU traits; exhibiting salient affective features).
- Daring-impulsive (i.e., DI traits; exhibiting sensation-seeking and daring impulsive tendencies).

Systematic research should be devoted to examining how these symptom subdimensions synergize (i.e., interact) with one another, and in turn with conduct problems, in predicting conceptually significant criterion variables and clinically important behavioral outcomes. In our view, incorporation of these symptom subdimensions into existing nosological systems will lead to more precise clinical descriptions of youth with CD and accelerate advances in clinical care.

#### REFERENCES

- Achenbach, T. M. (1991). Manual for the Child Behavior Checklist and 1991 profile. Burlington: University of Vermont Press.
- American Psychiatric Association. (1980). Diagnostic and statistical manual of mental disorders (3rd ed.). Washington, DC: Author.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: Author.
- Anastassiou-Hadjicharalambous, X., & Warden, D. (2008). Physiologically-indexed and self-perceived affective empathy in conduct-disordered children high and low on callous–unemotional traits. *Child Psychiatry and Human Development*, 39, 503–517.
- Andershed, H., & Andershed, A.-K. (2008). The implications of heterogeneity among individuals with antisocial behavior. In D. Canter & R. Zukauskiene (Eds.), Psychology, crime, and law: New horizons—international perspectives (pp. 103–117). Aldershot, UK: Ashgate.
- Andershed, H., Hodgins, S., & Tengström, A. (2007). Convergent validity of the Youth Psychopathic Traits Inventory (YPI): Association with the Psychopathy Checklist: Youth Version (PCL:YV). Assessment, 14, 144–154.
- Andershed, H., Kerr, M., Stattin, H., & Levander, S. (2002). Psychopathic traits in non-referred youths: A new assessment tool. In E. Blauuw & L. Sheridan (Eds.), Psychopaths: Current international perspectives (pp. 131–158). The Hague: Elsevier.
- Andershed, H., Köhler, D., Eno Louden, J., & Hinrichs, G. (2008). Does the three-factor model of psychopathy identify a problematic subgroup of young offenders? International Journal of Law and Psychiatry, 31, 189–198.
- Ang, R. P., Ong, E. L., Lim, J. Y., & Lim, E. W. (2010). From narcissistic exploitativeness to bullying behavior: The mediating role of approval-of-aggression beliefs. Social Development, 19, 721–735.
- Assary, E., Salekin, R. T., & Barker, E. D. (2015). Big-Five and callous–unemotional traits in preschoolers. *Journal of Psychopathology and Behavioral Assessment*, 37, 371–379.
- Asscher, J. J., van Vugt, E. S., Stams, G. J. J. M., Deković, M., Eichelsheim, V. I., & Yousfi, S. (2011). The relationship between juvenile psychopathic traits, delinquency and (violent) recidivism: A metaanalysis. *Journal of Child Psychology and Psychiatry*, 52, 1134–1143.
- Bandstra, N. F., Chambers, C. T., McGrath, P. J., & Moore, C. (2011). The behavioral expression of empathy to others' pain versus others' sadness in young children. *Pain*, 152, 1074–1082.
- Barker, E. D., Oliver, B. R., Viding, E., Salekin, R. T., & Maughan, B. (2011). The impact of prenatal maternal risk, fearless temperament, and early parenting on adolescent callous–unemotional traits: A 14-year

longitudinal investigation. Journal of Child Psychology and Psychiatry, 52, 878–888.

- Barker, E. D., & Salekin, R. T. (2012). Irritable oppositional defiance and callous unemotional traits: Is the association partially explained by peer victimization? *Journal of Child Psychology and Psychiatry*, 53, 1167–1175.
- Barker, E. D., Trentacosta, C. J., & Salekin, R. T. (2011). Are impulsive adolescents differentially influenced by the good and bad of neighborhood and family? *Journal of Abnormal Psychology*, 120, 981–986.
- Barrett, K. C., & Campos, J. J. (1987). Perspectives on emotional development: II. A functionalist approach to emotions. In J. D. Osofsky (Ed.), *Handbook of infant development* (pp. 555–578). New York: Wiley.
- Barry, C. T., Frick, P. J., & Killian, A. L. (2003). The relation of narcissism and self-esteem to conduct problems in children: A preliminary investigation. *Journal of Clinical Child and Adolescent Psychology*, 32, 139–152.
- Barry, T. D., Barry, C. T., Deming, A. M., & Lochman, J. E. (2008). Stability of psychopathic characteristics in childhood: The influence of social relationships. *Criminal Justice and Behavior*, 35, 244–262.
- Barry, T. D., Thompson, A., Barry, C. T., Lochman, J. E., Adler, K., & Hill, K. (2007). The importance of narcissism in predicting proactive and reactive aggression in moderately to highly aggressive children. *Aggressive Behavior*, 33, 185–197.
- Baumeister, R. F., Smart, L., & Boden, J. M. (1996). Relation of threatened egotism to violence and aggression: The dark side of high self-esteem. *Psychological Review*, 103, 5–33.
- Beitchman, J. H., Zai, C. C., Muir, K., Berall, L., Nowrouzi, B., Choi, E., et al. (2012). Childhood aggression, callous–unemotional traits and oxytocin genes. *European Child and Adolescent Psychiatry*, 21, 125–132.
- Belacchi, C., & Farina, E. (2012). Feeling and thinking of others: Affective and cognitive empathy and emotion comprehension in prosocial/hostile preschoolers. Aggressive Behavior, 38, 150–165.
- Berg, J. M., Lilienfeld, S. O., Reddy, S. D., Latzman, R. D., Roose, A., Craighead, I. W., et al. (2013). The Inventory of Callous Unemotional traits: A construct validation analysis in an at-risk sample. Assessment, 20, 532–544.
- Blair, R. J. R., Budhani, S., Colledge, E., & Scott, S. (2005). Deafness to fear in boys with psychopathic tendencies. *Journal of Child Psychology and Psychiatry*, 46, 327–336.
- Blair, R. J. R., Colledge, E., Murray, L., & Mitchell, D. G. V. (2001). A selective impairment in the processing of sad and fearful expressions in children with psychopathic tendencies. *Journal of Abnormal Child Psychology*, 29, 491–498.
- Blair, R. J. R., Monson, J., & Fredrickson, N. (2001). Moral reasoning and conduct problems in children with emotional and behavioral difficulties. *Personality and Individual Differences*, 31, 799–811.

- Blonigen, D. M., Patrick, C. J., Douglas, K. S., Poythress, N. G., Skeem, J. L., Lilienfeld, S. O., et al. (2010). Multimethod assessment of psychopathy in relation to factors of internalizing and externalizing from the Personality Assessment Inventory: The impact of method variance and suppressor effects. *Psychological Assessment*, 22, 96–107.
- Brandt, J. R., Kennedy, W. A., Patrick, C. J., & Curtin, J. J. (1997). Assessment of psychopathy in a population of incarcerated adolescent offenders. *Psychological Assessment*, 9, 429–435.
- Bretherton, I., Gullón-Rivera, Á. L., Page, T. F., Oettel, B. J., Corey, J. M., & Golby, B. J. (2013). Children's attachment-related self-worth: A multi-method investigation of postdivorce preschoolers' relationships with their mothers and peers. Attachment and Human Development, 15, 25–49.
- Budhani, S., & Blair, R. J. R. (2005). Response reversal and children with psychopathic tendencies: Success is a function of salience of contingency change. *Journal of Child Psychology and Psychiatry*, 46, 972–981.
- Bukowski, W. M., Schwartzman, A., Santo, J., Bagwell, C., & Adams, R. (2009). Reactivity and distortions in the self: Narcissism, types of aggression, and the functioning of the hypothalamic–pituitary–adrenal axis during early adolescence. *Development and Psychopathology*, 21, 1249–1262.
- Burke, J. D., Boylan, K., Rowe, R., Duku, E., Stepp, S. D., Hipwell, A. E., et al. (2014). Identifying the irritability dimension of ODD: Application of a modified bifactor model across five large community samples of children. *Journal of Abnormal Psychology*, 123, 841–851.
- Burke, J. D., & Loeber, R. (2010). Oppositional defiant disorder and the explanation of the comorbidity between behavioral disorders and depression. *Clinical Psychology: Science and Practice*, 17, 319–326.
- Burke, J. D., Loeber, R., & Lahey, B. B. (2007). Adolescent conduct disorder and interpersonal callousness as predictors of psychopathy in young adults. *Journal of Clinical Child and Adolescent Psychology*, 36, 334–346.
- Byrd, A. L., Loeber, R., & Pardini, D. A. (2014). Antisocial behavior, psychopathic features, and abnormalities in reward and punishment processing. *Clinical Child and Family Psychological Review*, 17, 125–156.
- Caldwell, M., Skeem, J. L., Salekin, R. T., & Van Rybroek, G. (2006). Treatment response of adolescent offenders with psychopathy features: A two year follow-up. Criminal Justice and Behavior, 33, 571–596.
- Caprara, G. V., Vecchione, M., Barbaranelli, C., & Alessandri, G. (2013). Emotional stability and affective self-regulatory efficacy beliefs: Proofs of integration between trait theory and social cognitive theory. *European Journal of Personality*, 27, 145–154.
- Caputo, A. A., Frick, P. J., & Brodsky, S. L. (1999). Family violence and juvenile sex offending: Potential mediating roles of psychopathic traits and negative attitudes toward women. Criminal Justice and Behavior, 26, 338–356.

- Carlson, K. S., & Gjerde, P. F. (2009). Preschool personality antecedents of narcissism in adolescence and young adulthood: A 20-year longitudinal study. *Journal of Research in Personality*, 43, 570–578.
- Carlson, S. M. (2005). Developmentally sensitive measures of executive function in preschool children. *De*velopmental Neuropsychology, 28, 595–616.
- Caspi, A., Block, J., Block, J. H., Lynam, D., Moffitt, T. E., & Stouthamer-Loeber, M. (1992). A "common language" version of the California Child Q-Set (CCQ) for personality assessment. *Psychological As*sessment, 4, 512–523.
- Centifanti, L. C. M., & Modecki, K. (2013). Throwing caution to the wind: Callous–unemotional traits an risk-taking in adolescents. *Journal of Child and Adolescent Psychology*, 42, 106–119.
- Chabrol, H., Van Leeuwen, N., Rodgers, R. F., & Gibbs, J. C. (2011). Relations between self-serving cognitive distortions, psychopathic traits, and antisocial behavior in a non-clinical sample of adolescents. *Per*sonality and Individual Differences, 51, 887–892.
- Chacko, A., Kofler, M., & Jarrett, M. (2014). Improving outcomes for youth with ADHD: A conceptual framework for combined neurocognitive and skillbased treatment approaches. *Clinical Child Family Psychology Review*, 17, 368–384.
- Chandler, M., & Moran, T. (1990). Psychopathy and moral development: A comparative study of delinquent and nondelinquent youth. *Development and Psychopathology*, 2, 227–246.
- Cheng, Y., Hung, A.-Y., & Decety, J. (2012). Dissociation between affective sharing and emotion understanding in juvenile psychopaths. *Development and Psychopathology*, 24, 623–636.
- Christian, R., Frick, P. J., Hill, N., Tyler, L. A., & Frazer, D. (1997). Psychopathy and conduct problems in children: II. Implications for subtyping children with conduct problems. *Journal of the American Academy* of Child and Adolescent Psychiatry, 36, 233–241.
- Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. Psychological Assessment, 7, 309–319.
- Cleckley, H. (1941). The mask of sanity. St. Louis, MO: Mosby.
- Cleckley, H. (1976). The mask of sanity (5th ed.). St. Louis, MO: Mosby.
- Cloninger, C. R. (1978). The antisocial personality. Hospital Practice, 13, 97–106.
- Colins, O. F., & Andershed, H. (2015). The DSM-5 with Limited Prosocial Emotions Specifier for conduct disorder among detained girls. *Law and Human Behavior*, 39, 198–207.
- Colins, O. F., Andershed, H., Fanti, K. A., & Larsson, H. (2017). Psychopathic traits in early childhood: Further validation of the Child Problematic Traits Inventory. Assessment, 24(5), 602–614.
- Colins, O. F., Andershed, H., Frogner, L., Lopez-Romero, L., Veen, V., & Andershed, A.-K. (2014). A new measure to assess psychopathic personality in chil-

dren: The Child Problematic Traits Inventory. *Journal of Psychopathology and Behavioral Assessment*, 36, 4–21.

- Colins, O. F., Bijttebier, P., Broekaert, E., & Andershed, H. (2014). Psychopathic-like traits among detained female adolescents: Reliability and validity of the Antisocial Process Screening Device and the Youth Psychopathic Traits Inventory. Assessment, 21, 195– 209.
- Colins, O. F., Noom, M., & Vanderplasschen, W. (2012). Youth Psychopathic Traits Inventory-Short version: A further test of the internal consistency and criterion validity. *Journal of Psychopathology Behavior As*sessment, 34, 476–486.
- Colins, O. F., Veen, V., Veenstra, M., Frogner, L., & Andershed, H. (2016). The Child Problematic Traits Inventory in a Dutch general population sample of 3- to 7-year-old children. *European Journal of Psychological* Assessment. [Epub ahead of print]
- Colins, O. F., Vermeiren, R., De Bolle, M., & Broekaert, E. (2012). Self-reported psychopathic-like traits as predictors of recidivism in detained male adolescents. *Criminal Justice and Behavior*, 39, 1421–1435.
- Cooke, D. J., & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment*, 13, 171–188.
- Corrado, R. R., Vincent, G. M., Hart, S. D., & Cohen, I. M. (2004). Predictive validity of the Psychopathy Checklist: Youth Version for general and violent recidivism. Behavioral Sciences and the Law, 22, 5–22.
- Cramer, P. (2011). Young adult narcissism: A 20-year longitudinal study of the contribution of parenting styles, preschool precursors of narcissism, and denial. *Journal of Research in Personality*, 45, 19–28.
- Dadds, M. R., El Masry, Y., Wimalaweera, S., & Guastella, A. J. (2008). Reduced eye gaze explains "fear blindness" in child psychopathic traits. *Journal of the American Academy of Child and Adolescent Psychia*try, 47, 455–463.
- Dawel, A., O'Kearney, R. O., McKone, E., & Palermo, R. (2012). Not just fear and sadness: Meta-analytic evidence of pervasive emotion recognition deficits for facial and vocal expressions in psychopathy. *Neuroscience and Biobehavioral Reviews*, 36, 2288–2304.
- de Wied, M., van Boxtel, A., Matthys, W., & Meeus, W. (2012). Verbal, facial and autonomic responses to empathy-eliciting film clips by disruptive male adolescents with high versus low callous unemotional traits. *Journal of Abnormal Child Psychology*, 40, 211–223.
- Dillard, C. L., Salekin, R. T., Barker, E. D., & Grimes, R. D. (2013). Psychopathy in adolescent offenders: An item response theory study of the antisocial process screening device-self report and the Psychopathy Checklist: Youth Version. Personality Disorders: Theory, Research, and Treatment, 4, 101–120.
- Dong, L., Wu, H., & Waldman, I. D. (2014). Measurement and structural invariance of the antisocial process screening device. *Psychological Assessment*, 26, 598–608.

- Dunn, J. (1987). The beginnings of moral understanding: Development in the second year. In J. Kagan & S. Lamb (Eds.), *The emergence of morality in young children* (pp. 91–112). Chicago: University of Chicago Press.
- Edens, J. F., Skeem, J. L., Cruise, K. R., & Cauffman, E. (2001). Assessment of "juvenile psychopathy" and its association with violence: A critical review. Behavioral Sciences and the Law, 19, 53–80.
- Egger, H. L., & Angold, A. (2006). Common emotional and behavioral disorders in preschool children: Presentation, nosology, and epidemiology. *Journal of Child Psychology and Psychiatry*, 47, 313–337.
- Eisenberg, N., & Mussen, P. A. (1989). The roots of prosocial behavior in children. New York: Cambridge University Press.
- Elkind, D. (1967). Egocentricism in adolescence. Child Development, 38, 1025–1034.
- Emde, R. N., Biringen, Z., Clyman, R. B., & Oppenheim, D. (1991). The moral self of infancy: Affective core and procedural knowledge. *Developmental Re*view, 11, 251–270.
- Evans, A. D., & Lee, K. (2013). Emergence of lying in very young children. *Developmental Psychology*, 49, 1958–1963.
- Evans, A. D., Xu, F., & Lee, K. (2011). When all signs point to you: Lies told in the face of evidence. *Developmental Psychology*, 47, 39–49.
- Fairchild, G., van Goozen, S. H., Stollery, S. J., Aitken, M. R. F., Savage, J., Moore, S. C., et al. (2009). Decision making and executive function in male adolescents with early-onset or adolescent-onset conduct disorder and control subjects. *Biological Psychiatry*, 66, 162–168.
- Falkenbach, D. M., Poythress, N. G., & Heide, K. M. (2003). Psychopathic features in a juvenile diversion population: Reliability and predictive validity of two self-report measures. *Behavioral Sciences and the Law*, 21, 787–805.
- Farrington, D. P. (2005). The importance of child and adolescent psychopathy. Journal of Abnormal Child Psychology, 33, 489–498.
- Finger, E. C., Marsh, A., Blair, K. S., Majestic, C., Evangelou, I., Gupta, K., et al. (2012). Impaired functional but preserved structural connectivity in limbic white matter tracts in youth with conduct disorder or oppositional defiant disorder plus psychopathic traits. *Psychiatric Research: Neuroimaging*, 202, 239–244.
- Finger, E. C., Marsh, A. A., Mitchell, D. G., Reid, M. E., Sims, C., Budhani, S., et al. (2008). Abnormal ventromedial prefrontal cortex function in children with psychopathic traits during reversal learning. Archives of General Psychiatry, 65, 586–594.
- Fisher, L., & Blair, R. J. R. (1998). Cognitive impairment and its relationship to psychopathic tendencies in children with emotional and behavioral difficulties. *Journal of Abnormal Child Psychology*, 26, 511–519.
- Forsman, M., Lichtenstein, P., Andershed, H., & Larsson, H. (2008). Genetic effects explain the stability

of psychopathic personality from mid- to late adolescence. Journal of Abnormal Psychology, 117, 606–617.

- Forth, A. E. (1995). Psychopathy in adolescent offenders: Assessment, family background, and violence. Issues in Criminological and Legal Psychology, 24, 42–44.
- Forth, A. E., Hare, R. D., & Hart, S. D. (1990). Assessment of psychopathy in male young offenders. Psychological Assessment, 2, 342–344.
- Forth, A. E., Kosson, D. S., & Hare, R. D. (2003). The Psychopathy Checklist: Youth Version. Toronto: Multi-Health Systems. (Original work published 1996)
- Fowler, T., Langley, K., Rice, F., van den Bree, M., Ross, K., Wilkinson, L. S., et al. (2009). Psychopathy trait scores in adolescents with childhood ADHD: The contribution of genotypes affecting MAOA, 5HTT, and COMPT activity. *Psychiatric Genetics*, 19, 312– 319.
- Frick, P. J. (2009). Extending the construct of psychopathy to youth: Implications for understanding, diagnosing, and treating antisocial children and adolescents. *Canadian Journal of Psychiatry*, 54, 803–812.
- Frick, P. J., Bodin, S. D., & Barry, C. T. (2000). Psychopathic traits and conduct problems in community and clinic-referred samples of children: Further development of the Psychopathy Screening Device. *Psychological Assessment*, 12, 382–393.
- Frick, P. J., Cornell, A., Barry, C. T., Bodin, S. D., & Dane, H. (2003). Callous–unemotional traits and conduct problems in the prediction of conduct problem severity, aggression, and self-report of delinquency. Journal of Abnormal Child Psychology, 31, 457–470.
- Frick, P. J., & Hare, R. D. (2001). Antisocial Process Screening Device. Toronto: Multi-Health Systems.
- Frick, P. J., Kimonis, E. R., Dandreaux, D. M., & Farell, J. M. (2003). The 4 year stability of psychopathic traits in non-referred youth. *Behavioral Sciences and the Law*, 21, 1–24.
- Frick, P. J., O'Brien, B. S., Wootton, J. M., & McBurnett, K. (1994). Psychopathy and conduct problems in children. *Journal of Abnormal Psychology*, 103, 700–707.
- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014). Annual Research Review: A developmental psychopathology approach to understanding callous–unemotional traits in children and adolescents with serious conduct problems. *Journal of Child Psychology and Psychiatry*, 55, 532–548.
- Frick, P. J., Stickle, T. R., Dandreaux, D. M., Farell, J. M., & Kimonis, E. R. (2005). Callous–unemotional traits in predicting the severity and stability of conduct problems and delinquency. *Journal of Abnormal Child Psychology*, 33, 471–488.
- Frick, P. J., & White, S. F. (2008). Research Review: The importance of callous–unemotional traits for developmental models of aggressive and antisocial behavior. *Journal of Child Psychology and Psychiatry*, 49, 359–375.
- Fu, G., Evans, D. E., Xu, F., & Lee, K. (2012). Young children can tell strategic lies after committing a

transgression. Journal of Experimental Child Psychology, 113, 147–158.

- Fung, M. T., Raine, A., Loeber, R., Lynam, D. R., Steinhauer, S. R., & Venables, P. H. (2005). Reduced electrodermal activity in psychopathy-prone adolescents. *Journal of Abnormal Psychology*, 114, 187–196.
- Gao, Y., Raine, A., Venables, P. H., Dawson, M. E., & Mednick, S. A. (2010). Association of poor childhood fear conditioning and adult crime. *American Journal of Psychiatry*, 167, 56–60.
- Gao, Y., & Zhang, W. (2016). Confirmatory factor analyses of self- and parent-report Inventory of Callous–Unemotional Traits in 8- to 10-year-olds. *Journal of Psychopathology and Behavioral Assessment, 38*, 331–340.
- Garon, N., Bryson, S. E., & Smith, I. M. (2008). Executive function in preschoolers: A review using an integrative framework. *Psychological Bulletin*, 134, 31–60.
- Gretton, H. M., Hare, R. D., & Catchpole, R. E. H. (2004). Psychopathy and offending from adolescence to adulthood: A ten-year follow up. *Journal of Consulting and Clinical Psychology*, 72, 636–645.
- Haan, N., Aerts, E., & Cooper, B. A. (1987). On moral grounds. New York: New York University Press.
- Haas, S. M., Waschbusch, D. A., Pelham, W. E., King, S., Andrade, B. F., & Carrey, N. J. (2011). Treatment response in CP/ADHD children with callous/unemotional traits. *Journal of Abnormal Child Psychol*ogy, 39, 541–552.
- Hare, R. D. (2003). Manual for the Revised Psychopathy Checklist (2nd ed.). Toronto: Multi-Health Systems. (Original work published 1991)
- Hart, S. D., Watt, K. A., & Vincent, G. M. (2002). Commentary on Seagrave and Grisso: Impressions of the state of the art. *Law and Human Behavior*, 26, 241–245.
- Harter, S. (1990). Causes, correlates and functional role of global self-worth: A life span perspective. In R. J. Sternberg & J. Kolligan (Eds.), *Competence considered* (pp. 67–97). New Haven, CT: Yale University Press.
- Hawes, D. J., & Dadds, M. R. (2005). The treatment of conduct problems in children with callous–unemotional traits. Journal of Consulting and Clinical Psychology, 73, 737–741.
- Hawes, S. W., Mulvey, E. P., Schubert, C. A., & Pardini, D. A. (2014). Structural coherence and temporal stability of psychopathic personality features during emerging adulthood. *Journal of Abnormal Psychology*, 123, 623–633.
- Hillege, S., Das, J., & de Ruiter, C. (2010). The Youth Psychopathic Traits Inventory: Psychometric properties and its relation to substance use and interpersonal style in a Dutch sample of non-referred adolescents. *Journal of Adolescence*, 33, 83–91.
- Hirata, Y., Zai, C. C., Nowrouzi, B., Beitchman, J. H., & Kennedy, J. L. (2013). Study of the catechol-O-methyltransferase (COMPT) gene with high aggression in children. Aggressive Behavior, 39, 45–51.

- Horton, R. S., & Tritch, T. (2014). Clarifying the links between grandiose narcissism and parenting. *Journal* of Psychology, 148, 133–143.
- Hsu, Y., & Cheung, H. (2013). Two mentalizing capacities and the understanding of two types of lie telling in children. *Developmental Psychology*, 49, 1650–1659.
- Iacono, W. G., Vaidyanathan, U., Vrieze, S. I., & Malone, S. M. (2014). Knowns and unknowns for psychophysiological endophenotypes: Integration and response to commentaries. *Psychophysiology*, 51, 1339–1347.
- Isen, J., Raine, A., Baker, L., Dawson, M., Bezdjian, S., & Lozano, D. I. (2010). Sex-specific association between psychopathic traits and electrodermal reactivity in children. *Journal of Abnormal Psychology*, 119, 216–225.
- Johnstone, L., & Cooke, D. J. (2004). Psychopathiclike traits in childhood: Conceptual and measurement concerns. Behavioral Sciences and the Law, 22, 103–125.
- Jonason, P. K., Lyons, M., & Bethell, E. (2014). The making of Darth Vader: Parent–child care and the dark triad. Personality and Individual Differences, 67, 30–34.
- Jones, A. P., Laurens, K. R., Herba, C. M., Barker, G. J., & Viding, E. (2009). Amygdala hypoactivity to fearful faces in boys with conduct problems and callous– unemotional traits. *American Journal of Psychiatry*, 166, 95–102.
- Jones, S., Cauffman, E., Miller, J. D., & Mulvey, E. (2006). Investigating different factor structures of the Psychopathy Checklist: Youth Version: Confirmatory factor analytic findings. *Psychological Assessment*, 18, 33–48.
- Jordan, C. H., Spencer, S. J., Zanna, M. P., Hoshino-Browne, E., & Correll, J. (2003). Secure and defensive high self-esteem. *Journal of Personality and Social Psychology*, 85, 969–978.
- Kahn, R. E., Frick, P. J., Youngstrom, E., Findling, R. L., & Youngstrom, J. K. (2012). The effects of including a callous–unemotional specifier for the diagnosis of conduct disorder. *Journal of Child Psychology and Psychiatry*, 53, 271–282.
- Karpman, B. (1941). On the need for separating psychopathy into two distinct clinical types: Symptomatic and idiopathic. *Journal of Criminology and Psychopathology*, 3, 112–137.
- Kazdin, A. E. (1997). Conduct disorders across the lifespan. In S. S. Luthar, J. A. Burack, D. Cicchetti, & J. R. Weisz (Eds.), Developmental psychopathy, perspectives on adjustment, risk, and disorder (pp. 248–272). New York: Cambridge University Press.
- Kerig, K. P., & Stellwagen, K. K. (2010). Roles of callous–unemotional traits, narcissism, and Machiavellianism in childhood aggression. *Journal of Psychopa*thology and Behavioral Assessment, 32, 343–352.
- Kimonis, E. R., Frick, P. J., Skeem, J. L., Marsee, M. A., Cruise, K. R., Muñoz, L. C., et al. (2008). Assessing callous–unemotional traits in adolescent offenders: Validation of the Inventory of Callous–Unemotional

traits. International Journal of Law and Psychiatry, 31, 241–252.

- Knafo, A., Zahn-Waxler, C., Davidov, M., van Hulle, C., Robinson, J., & Rhee, S. Y. (2009). Empathy in early childhood: Genetic, environmental, and affective contributions. Values, Empathy, and Fairness across Social Barriers, 1167, 103–114.
- Kochanska, G. (1993). Toward a synthesis of parental socialization and child temperament in early development of conscience. *Child Development*, 64, 325– 347.
- Kochanska, G., Koenig, J. L., Barry, R. A., Kim, S., & Yoon, J. E. (2010). Children's conscience during toddler and preschool years, moral self, and competent, adaptive developmental trajectory. *Developmental Psychology*, 46, 1320–1332.
- Kolko, D. J., Dorn, L. D., Bukstein, O. G., Pardini, D., Holden, E. A., & Hart, J. (2009). Community vs. clinic-based modular treatment of children with early-onset ODD or CD: A clinical trial with 3-year follow-up. Journal of Abnormal Child Psychology, 37, 591–609.
- Kosson, D. S., Neumann, C. S., Forth, A. E., Salekin, R. T., Hare, R. D., Krischer, M. K., et al. (2013). Factor structure of the Hare Psychopathy Checklist: Youth Version (PCL:YV) in adolescent females. *Psychological Assessment*, 25, 71–83.
- Kotler, J. S., & McMahon, R. J. (2010). Assessment of child and adolescent psychopathy. In R. T. Salekin & D. R. Lynam (Eds.), *Handbook of child and adolescent psychopathy* (pp. 79–109). New York: Guilford Press.
- Kraut, R. E., & Price, J. D. (1976). Machiavellianism in parents and their children. *Journal of Personality and Social Psychology*, 33, 782–786.
- Krieger, F. V., Polanczyk, G. V., Goodman, R., Rhode, L. A., Graeff-Martins, A. S., Salum, G., et al. (2013). Dimension of oppositionality in a Brazilian community sample: Testing the DSM-5 proposal and etiological links. *Journal of the American Academy of Child and Adolescent Psychiatry*, 52, 389–400.
- Lahey, B. B. (2014). What we need to know about callous-unemotional traits: Comment on Frick, Ray, Thornton, and Kahn. *Psychological Bulletin*, 140, 58–63.
- Lahey, B. B., & Waldman, I. D. (2003). A developmental propensity model of the origins of conduct problems during childhood and adolescence. In B. B. Lahey, T. E. Moffitt, & A. Caspi (Eds.), Causes of conduct disorder and juvenile delinquency (pp. 76–117). New York: Guilford Press.
- Larsson, H., Andershed, H., & Lichtenstein, P. (2006). A genetic factor explains most of the variation in psychopathic personality. *Journal of Abnormal Psychology*, 115, 221–230.
- Latzman, R. D., Lilienfeld, S. O., Latzman, N. E., & Clark, L. A. (2013). Exploring callous and unemotional traits in youth via general personality traits: An eye toward DSM-5. Personality Disorders: Theory, Research, and Treatment, 4, 191–202.

- Lau, K. S. L., & Marsee, M. A. (2013). Exploring narcissism, psychopathy, and Machiavellianism in youth: Examination of associations with antisocial behavior and aggression. Journal of Child and Family Studies, 22, 355–367.
- Leistico, A.-M. R., Salekin, R. T., DeCoster, J., & Rogers, R. (2008). A large-scale meta-analysis relating the Hare measures of psychopathy to antisocial conduct. Law and Human Behavior, 32, 28–45.
- Lewis, M., Stanger, C., & Sullivan, M. W. (1989). Deception in 3-year-olds. *Developmental Psychology*, 25, 439–443.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in non-criminal populations. *Journal of Personality Assessment*, 66, 488–524.
- Loeber, R., Pardini, D. A., Hipwell, A., Stouthamer-Loeber, M., Keenan, K., & Sembower, M. A. (2009). Are there stable factors in preadolescent girls' externalizing behaviors. *Journal of Abnormal Child Psychology*, 37, 777–791.
- Loevinger, J. (1957). Objective tests as instruments of psychological theory. Psychological Reports, 3, 635– 694.
- Loney, B. R., Frick, P. J., Clements, C. B., Ellis, M. L., & Kerlin, K. (2003). Callous–unemotional traits, impulsivity, and emotional processing in antisocial adolescents. *Journal of Clinical Child and Adolescent Psychology*, 32(1), 66–80.
- Loney, B. R., Frick, P. J., Ellis, M. L., & McCoy, M. G. (1998). Intelligence, psychopathy, and antisocial behavior. Journal of Psychopathology and Behavioral Assessment, 20, 231–247.
- Lynam, D. R. (1996). Early identification of chronic offenders: Who is the fledgling psychopath? *Psychological Bulletin*, 120, 209–234.
- Lynam, D. R. (1998). Early identification of the fledgling psychopath: Locating the psychopathic child in the current nomenclature. *Journal of Abnormal Psychology*, 107, 566–575.
- Lynam, D. R., Caspi, A., Moffitt, T. E., Loeber, R., & Stouthamer-Loeber, M. (2007). Longitudinal evidence that psychopathy scores in early adolescence predict adult psychopathy. *Journal of Abnormal Psychology*, 116, 155–165.
- Lynam, D. R., Caspi, A., Moffitt, T. E., Raine, A., Loeber, R., & Stouthamer-Loeber, M. (2005). Adolescent psychopathy and the Big Five: Results from two samples. *Journal of Abnormal Child Psychology*, 33, 431–444.
- Malti, T., & Krettenauer, T. (2013). The relation of moral emotion attributions to prosocial and antisocial behavior. A meta-analysis. *Child Development*, 84, 397–412.
- Marini, V. A., & Stickle, T. R. (2010). Evidence for deficits in reward responsivity in antisocial youth with callous–unemotional traits. *Personality Disorders: Theory, Research, and Treatment*, 1, 218–229.

- McCord, W., & McCord, J. (1964). The psychopath: An essay on the criminal mind. Princeton, NJ: Van Nostrand. (Original work published in 1959)
- McDonald, N. M., & Messinger, D. S. (2011). The development of empathy: How, when, and why. In A. Acerbi, J. A. Lombo, & J. J. Sanguineti (Eds.), Moral behavior and free will: A neurobiological and philosophical approach (pp. 341–368). Morolo, Italy: IF Press.
- McDonald, R., Dodson, M. C., Rosenfield, D., & Jouriles, E. N. (2011). Effects of a parenting intervention on features of psychopathy in children. *Journal of Abnormal Child Psychology*, 39, 1013–1023.
- McKenzie, M. E., & Lee, S. S. (2014) Cognitive ability and psychopathic traits: Independent and interactive associations with youth conduct problems. *Journal of Abnormal Child Psychology*, 43, 761–771.
- Mills-Koonce, W. R., Wagner, N. J., Willoughby, M. T., Stifter, C., Blair, C., Granger, D. A., et al. (2015). Greater fear reactivity and psychophysiological hyperactivity among infants with later conduct problems and callous–unemotional traits. *Journal of Child Psychology and Psychiatry*, 56, 147–154.
- Moffitt, T. E., Arseneault, L., Jaffee, S. R., Kim-Cohen, J., Koenen, K. C., Odgers, C. L., et al. (2008). Research review: DSM-V conduct disorder: Research needs for an evidence base. Journal of Child Psychology and Psychiatry, 49, 3–33.
- Morrongiello, B. A., & Lasenby, J. (2006). Finding the daredevils: Development of a sensation seeking scale for children that is relevant to physical risk taking. *Accident Analysis and Prevention*, 38, 1101–1106.
- Morrongiello, B. A., Sandomierski, M., & Vall, J. (2012). Early identification of children at risk of unintentional injury: A sensation seeking scale for children 2–5 years of age. Accident Analysis and Prevention, 42, 1332–1337.
- Muñoz, L. C., & Anastassiou-Hadjicharalambous, X. (2011). Disinhibited behaviors in young children: Relations with impulsivity and autonomic psychophysiology. *Biological Psychiatry*, 86, 349–359.
- Muñoz, L. C., & Frick, P. J. (2007). The reliability, stability, and predictive utility of the self-report version of the Antisocial Process Screening Device. Scandinavian Journal of Psychology, 48, 299–312.
- Newman, J. P., Widom, C. S., & Nathan, S. (1985). Passive avoidance in syndromes of disinhibition: Psychopathy and extraversion. *Journal of Personality and Social Psychology*, 48, 1316–1327.
- Obradović, J., Pardini, D. A., Long, J. D., & Loeber, R. (2007). Measuring interpersonal callousness in boys from childhood to adolescence: An examination of longitudinal invariance and temporal stability. *Journal of Clinical Child and Adolescent Psychology*, 36, 276–292.
- O'Brien, B. S., & Frick, P. J. (1996). Reward dominance: Associations with anxiety, conduct problems, and psychopathy in children. *Journal of Abnormal Child Psychology*, 24, 223–240.
- Ojanen, T., Findley, D., & Fuller, S. (2012). Physical and

relational aggression in early adolescence: Associations with narcissism, temperament, and social goals. *Aggressive Behavior*, 38, 99–107.

- Orue, I., & Andershed, H. (2015). The Youth Psychopathic Traits Inventory–Short Version in Spanish adolescents—Factor structure, reliability, and relation with aggression, bullying, and cyber bullying. *Journal of Psychopathology and Behavioral Assessment*, 37, 563–575.
- Pardini, D. A., Lochman, J. E., & Powell, N. (2007). The development of callous–unemotional traits and antisocial behavior in children: Are their shared and unique predictors? *Journal of Clinical Child and Adolescent Psychology*, 36, 319–333.
- Pardini, D., Obradović, J., & Loeber, R. (2006). Interpersonal callousness, hyperactivity/impulsivity, inattention, and conduct problems as precursors to delinquency persistence in boys: A comparison of three grade-based cohorts. Journal of Clinical Child and Adolescent Psychology, 35, 46–59.
- Parry, M. A. (2006). Little Machiavellians: Deception in early childhood. Dissertation Abstracts International B: Sciences and Engineering, 67, 2860.
- Patrick, C. J. (2010). Conceptualizing the psychopathic personality: Disinhibited, bold, . . . or just plain mean? In R. T. Salekin & D. R. Lynam (Eds.), *Handbook of child and adolescent psychopathy* (pp. 15–48). New York: Guilford Press.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, 21, 913–938.
- Patterson, G. R. (1976). The aggressive child: Victim and architect of a coercive system. In E. J. Mash, L. A. Hamerlynck, & L. C. Handy (Eds.), *Behavior* modification and families (pp. 267–316). New York: Brunner/Mazel.
- Pauletti, R. E., Menon, M., Menon, M., Tobin, D. D., & Perry, D. G. (2012). Narcissism and adjustment in preadolescence. *Child Development*, 83, 831–837.
- Peskin, J. (1992). Ruse and representation: On children's ability to conceal information. *Developmental Psychology*, 28, 84–89.
- Polak, A., & Harris, P. L. (1999). Deception by young children following non-compliance. *Developmental Psychology*, 29, 74–87.
- Ponitz, C. C., McClelland, M. M., Matthews, J. S., & Morrison, F. J. (2009). A structured observation of behavioral self-regulation and its contribution to kindergarten outcomes. *Developmental Psychology*, 45, 605–619.
- Poythress, N. G., Dembo, R., Wareham, J., & Greenbaum, P. E. (2006). Construct validity of the youth psychopathic traits inventory (YPI) and the antisocial process screening device (APSD) with justiceinvolved adolescents. Criminal Justice and Behavior, 33, 26–55.
- Quay, H. C. (1964). Dimensions of personality in delin-

quent boys as inferred from the factor analysis of case history data. *Child Development*, *35*, 479–484.

- Quay, H. C. (1987). Patterns of delinquent behavior. In H. C. Quay (Ed.), *Handbook of juvenile delinquency* (pp. 118–138). New York: Wiley.
- Ribeiro da Silva, D., Rijo, D., & Salekin, R. T. (2012). Child and adolescent psychopathy: A state-of-the-art reflection of the construct and etiological theories. *Journal of Criminal Justice*, 40, 269–277.
- Rijsdijk, F., Viding, E., De Brito, S., Forgiarini, M., Mechelli, A., Jones, A., et al. (2010). Heritable variations in gray matter concentration as a potential endophenotype for psychopathic traits. Archives of General Psychiatry, 67, 406–413.
- Robins, L. N. (1966). Deviant children grown up: A sociological and psychiatric study of sociopathic personality. Baltimore: Williams & Wilkins.
- Robins, L. N. (1978). Sturdy childhood predictors of adult antisocial behavior: Replications from longitudinal studies. *Psychological Medicine*, 8, 611–622.
- Roche, M. J., Shoss, N. E., Pincus, A. L., & Menard, K. S. (2011). Psychopathy moderates the relationship between time in treatment and levels of empathy in incarcerated male sexual offenders. *Journal of Research and Treatment*, 23, 171–192.
- Roth-Hanania, R., Davidov, M., & Zahn-Waxler, C. (2011). Empathy development from 8 to 16 months: Early signs of concern for others. *Infant Behavior and Development*, 34, 447–458.
- Salekin, R. T. (2002). Psychopathy and therapeutic pessimism: Clinical lore or clinical reality? *Clinical Psychology Review*, 22, 79–112.
- Salekin, R. T. (2015). Forensic evaluation and treatment of juveniles: Innovation and best practices. Washington, DC: American Psychological Association.
- Salekin, R. T. (2016a). Psychopathy in childhood: Toward better informing the DSM-5 and ICD-11 conduct disorder specifiers. Personality Disorders: Theory, Research, and Treatment, 7, 180–191.
- Salekin, R. T. (2016b). Why should we care about grandiose-manipulative and daring-impulsive traits? British Journal of Psychiatry, 209, 189–191.
- Salekin, R. T. (2017). Research review: What do we know about psychopathic traits in children? *Journal* of Child Psychology and Psychiatry, 58, 1180–1200.
- Salekin, R. T., Brannen, D. N., Zalot, A. A., Leistico, A. R., & Neumann, C. S. (2006). Factor structure of psychopathy in youth: Testing the applicability of the new four factor model. *Criminal Justice and Behavior*, 33, 135–157.
- Salekin, R. T., & Frick, P. J. (2005). Psychopathy in children and adolescents: The need for a developmental psychopathology perspective. *Journal of Abnormal Child Psychology*, 33, 403–409.
- Salekin, R. T., & Hare, R. D. (2016). Proposed Specifiers for Conduct Disorder (PSCD). Unpublished test.
- Salekin, R. T., Leistico, A. R., Trobst, K. K., Schrum, C. L., & Lochman, J. E. (2005). Adolescent psychopathy and personality theory—the interpersonal cir-

cumplex: Expanding evidence of a nomological net. *Journal of Abnormal Child Psychology*, *33*, 445–460.

- Salekin, R. T., & Lynam, D. R. (Eds.). (2010). Handbook of child and adolescent psychopathy. New York: Guilford Press.
- Salekin, R. T., Neumann, C. S., Leistico, A. R., & Zalot, A. A. (2004). Psychopathy in youth and intelligence: An investigation of Cleckley's hypothesis. *Journal of Clinical Child and Adolescent Psychology*, 33, 731–742.
- Salekin, R. T., Rogers, R., & Machin, D. (2001). Psychopathy in youth: Pursuing diagnostic clarity. *Journal of Youth and Adolescence*, 30, 173–195.
- Salekin, R. T., Rogers, R., & Sewell, K. W. (1996). A review and meta-analysis of the Psychopathy Checklist and Psychopathy Checklist—Revised. Clinical Psychology: Science and Practice, 3, 203–215.
- Salekin, R. T., Tippey, J. G., & Allen, A. D. (2012). Treatment of conduct problem youth with interpersonal callous traits using Mental Models: Measurement of risk and change. *Behavioral Sciences and the Law*, 30, 470–486.
- Salekin, R. T., Worley, C. B., & Grimes, R. D. (2010). Treatment of psychopathy: A review and brief introduction to the mental models approach for psychopathy. *Behavioral Sciences and the Law*, 28, 235–266.
- Salmivalli, C. (2001). Feeling good about oneself, being bad to others?: Remarks on self-esteem, peer related self-esteem, hostility and aggressive behavior. Aggressive and Violent Behavior, 6, 375–393.
- Salmivalli, C., & Niemenen, E. (2002). Proactive and reactive aggression among school bullies, victims, and bully-victims. Aggressive Behavior, 28, 30–44.
- Sandseter, E. H., & Kennair, L. O. (2011). Children's risky play from an evolutionary perspective: The anti-phobic effects of thrilling experiences. *Evolution*ary Psychology, 9, 257–284.
- Scerbo, A., Raine, A., O'Brien, M., Chan, C., Rhee, C., & Smiley, N. (1990). Reward dominance and passive avoidance learning in adolescent psychopaths. *Journal of Abnormal Child Psychology*, 18, 451–463.
- Scholte, E., Stoutjesdijk, R., Van Oudheusden, M. A. G., Lodewijks, H., & Van der Ploeg, J. (2011). Screening of egocentric and unemotional characteristics in incarcerated and community children. *International Journal of Law and Psychiatry*, 33, 164–170.
- Seagrave, D., & Grisso, T. (2002). Adolescent development and the measurement of juvenile psychopathy. *Law and Human Behavior*, 26, 219–239.
- Sebastian, C. L., McCrory, E. J., Cecil, C. A., Lockwood, P. L., DeBrito, S. A., Fontaine, N. M., et al. (2012). Neural responses to affective and cognitive theory of mind in children with conduct problems and varying levels of callous–unemotional traits. Archives of General Psychiatry, 69, 814–822.
- Skeem, J. L., Polaschek, D. L., Patrick, C. J., & Lilienfeld, S. O. (2011). Psychopathic personality: Bridging the gap between scientific evidence and public policy. Psychological Science in the Public Interest, 12, 95–162.

- Somma, A., Andershed, H., Borroni, S., & Fossati, A. (2016). The validity of the Child Problematic Trait Inventory in 6–12 year old Italian children: Further support and issues of consistency across different sources of information and different samples. *Journal of Psychopathology and Behavioral Assessment, 38*, 350–372.
- Spain, S. E., Douglas, K. S., Poythress, N. G., & Epstein, M. (2004). The relationship between psychopathic features, violence and treatment outcome: The comparison of three youth measures of psychopathic features. *Behavioral Sciences and the Law*, 22, 85–102.
- Spitzer, R. L., Endicott, J., & Robins, E. (1975). Clinical criteria for psychiatric diagnosis and DSM-III. American Journal of Psychiatry, 131, 1187–1197.
- Stadler, C., Kroeger, A., Weyers, P., Grasmann, D., Horschinek, M., Freitag, C., et al. (2011). Cortisol reactivity in boys with attention-deficit/hyperactivity disorder and disruptive behavior problems: The impact of callous unemotional traits. *Psychiatry Research*, 187, 204–209.
- Stellwagen, K. K., & Kerig, P. K. (2013). Ringleader bullying: Association with psychopathic narcissism and theory of mind among child psychiatric inpatients. *Child Psychiatry and Human Development*, 44, 612– 620.
- Stouthamer-Loeber, M. (1986). Lying as a problem behavior in children: A review. Clinical Psychology Review, 6, 267–289.
- Stringaris, A., Cohen, P., Pine, D. S., & Leibenluft, E. (2009). Adult outcomes of youth irritability: A 20 year prospective community-based study. *American Journal of Psychiatry*, 166, 1048–1054.
- Stringaris, A., & Goodman, R. (2009a). Longitudinal outcome of youth oppositionality: Irritable, headstrong, and hurtful behaviors have distinctive predictions. Journal of the American Academy of Child and Adolescent Psychiatry, 48, 404–412.
- Stringaris, A., & Goodman, R. (2009b). Three dimensions of oppositionality in youth. Journal of Child Psychology and Psychiatry, 50, 216–223.
- Stringaris, A., Maughan, B., & Goodman, R. (2010). What is a disruptive behavior disorder?: Temperamental antecedents of oppositional defiant disorder: Findings from the Avon longitudinal study. *Journal* of the American Academy of Child and Adolescent Psychiatry, 49, 474–483.
- Stucke, T. S., & Sporer, S. L. (2002). When a grandiose self-image is threatened: Narcissism and self-concept clarity as predictors of negative emotions and aggression following ego-threat. *Journal of Personality*, 70, 509–532.
- Sullivan, L. E., & Gretton, H. (1996, March). Concurrent validity of the MMPI-A and the PCL-R in an adolescent forensic population. Poster presented at the meeting of the American Psychology–Law Society, Hilton Head, SC.
- Talwar, V., & Crossman, A. (2011). From little white lies to filthy liars: The evolution of honesty and decep-

tion in young children. Advances in Child Development and Behavior, 40, 139–179.

- Thomaes, S., Bushman, B. J., de Castro, B., Cohen, G. L., & Denissen, J. A. (2009). Reducing narcissistic aggression by buttressing self-esteem: An experimental field study. *Psychological Science*, 20(12), 1536–1542.
- Thomaes, S., Bushman, B., Orobrio de Castro, B., & Stegge, H. (2009). What makes narcissists bloom?: A framework for research on the etiology on the etiology and development of narcissism. *Development and Psychopathology*, 21, 1233–1247.
- Toupin, J., Mercier, H., Dery, M., Cote, G., & Hodgins, S. (1996). Validity of the PCL-R for adolescents. In D. J. Cooke, A. E. Forth, J. P. Newman, & R. D. Hare (Eds.), Issues in criminological and legal psychology: No. 24. International perspectives on psychopathy (pp. 143– 145). Leicester, UK: British Psychological Society.
- Trevethan, S. D., & Walker, L. J. (1989). Hypothetical versus real-life moral reasoning among psychopathic and delinquent youth. *Development and Psychopathol*ogy, 1, 91–103.
- Tsang, S., Schmidt, K. M., Vincent, G. M., Salekin, R. T., Moretti, M. M., & Odgers, C. L. (2015). Assessing psychopathy among justice involved adolescents with the PCL:YV: An item response theory examination across gender. Personality Disorders: Theory, Research, and Treatment, 6, 22–31.
- Vahl, P., Colins, O., Markus, M., Lodewijkcs, H., Doreleijers, T., & Vermeiren, R. (2014). Psychopathic-like traits in detained male adolescents: The usefulness of self-report outside a research context. European Child and Adolescent Psychiatry, 23, 691–699.
- Vaidyanathan, U., Patrick, C. J., & Iacono, W. G. (2011). Patterns of comorbidity among mental disorders: A person-centered approach. Comprehensive Psychiatry, 52, 527–535.
- van Baardewijk, Y., Andershed, H., Stegge, H., Nilsson, K. W., Scholte, E., & Vermeiren, R. (2010). Development and tests of short versions of the Youth Psychopathic Traits Inventory and the Youth Psychopathic Traits Inventory–Child Version. European Journal of Personality Assessment, 26, 122–128.
- van Baardewijk, Y., Stegge, H., Andershed, H., Thomaes, S., Scholte, E., & Vermeiren, R. (2008). Measuring psychopathic traits in children through selfreport: The development of the Youth Psychopathic Traits Inventory–Child Version. International Journal of Law and Psychiatry, 31, 199–209.
- van Baardewijk, Y., Vermeiren, R., Stegge, H., & Doreleijers, T. (2011). Self-reported psychopathic traits in children: Their stability and concurrent and prospective association with conduct problems and aggression. Journal of Psychopathology and Behavioral Assessment, 33, 236–245.
- Vaughn, M. G., & Howard, M. O. (2005). Self-report measures of juvenile psychopathic personality traits: A comparative review. *Journal of Emotional and Behavioral Disorders*, 13, 152–162.

- Veen, V., Stevens, G., Andershed, H., Raaijmakers, Q., Doreleijers, T., & Vollebergh, W. (2011). Crossethnic generalizability of the three-factor model of psychopathy: The Youth Psychopathic Traits Inventory in an incarcerated sample of native Dutch and Moroccan immigrant boys. International Journal of Law and Psychiatry, 34, 127–130.
- Viding, E., Hanscombe, K. B., Curtis, C. J., Davis, O. S., Meaburn, E. L., & Plomin, R. (2010). In search of genes associated with risk for psychopathic tendencies in children: A two-stage genome-wide association study of pooled DNA. *Journal of Child Psychology* and Psychiatry, 51, 780–788.
- Vincent, G. M., & Hart, S. D. (2002). Psychopathy in childhood and adolescence: Implications for the assessment and management of multi problem youths. In R. R. Corrado, R. Roesch, S. D. Hart, & J. K. Gierowski (Eds.), Multi-problem violent youth: A foundation for comparative research on needs, interventions, and outcomes (NATO Science Series A: Life Sciences) (pp. 150–163). Amsterdam: IOS Press.
- Vincent, G. M., Vitacco, M. J., Grisso, T., & Corrado, R. R. (2003). Subtypes of adolescent offenders: Affective traits and antisocial behavior patterns. Behavioral Sciences and the Law, 21, 695–712.
- Vitacco, M. J., & Salekin, R. T. (2013). Adolescent psychopathy and the law. In K. A. Kiehl & W. P. Sinnott-Armstrong (Eds.), *Handbook on psychopathy* and law (pp. 78–89). New York: Oxford University Press.
- Vitale, J. E., Newman, J. P., Bates, J. E., Goodnight, J., Dodge, K. A., & Pettit, G. S. (2005). Deficient behavioral inhibition and anomalous selective attention in a community sample of adolescents with psychopathic traits and low-anxiety traits. *Journal of Abnormal Child Psychology*, 33, 461–470.
- Waller, R., Gardner, F., Hyde, L. W., Shaw, D. S., Dishion, T. J., & Wilson, M. N. (2012). Do harsh and positive parenting predict parents' reports of deceitful–callous behavior in childhood? *Journal of Child Psychology and Psychiatry*, 53, 946–953.
- Waschbusch, D. A., Walsh, T. M., Andrade, B. F., King, S., & Carrey, N. J. (2007). Social problem solving, conduct problems, and callous–unemotional traits in children. *Child Psychiatry and Human Development*, 37, 293–305.
- Washburn, J. J., McMahon, R., King, C. A., Reinecke, M. A., Silver, C. (2004). Narcissistic features in young adolescents: Relations to aggression and internalizing symptoms. *Journal of Youth and Adolescence*, 33, 247–260.
- Whelan, Y. M., Stingaris, A., Maughn, B., & Barker, E. D. (2013). Developmental continuity of oppositional defiant disorder subdimensions at ages 8, 10, and 13 years and their distict psychiatric outcomes at age 16 years. Journal of the American Academy of Child and Adolescent Psychiatry, 52, 961–969.
- White, S. F., Brislin, S. J., Meffert, H., Sinclair, S., & Blair, R. J. R. (2013). Callous–unemotional traits

modulate the neural response associated with punishing another individual during social exchange: A preliminary investigation. *Journal of Personality Disorders*, 27, 99–112.

- White, S. F., Marsh, A. A., Fowler, K. A., Schechter, J. C., Aldalio, C., Pope, K., et al. (2012). Reduced amygdala response in youths with disruptive behavior disorders and psychopathic traits: Decreased emotional response versus increased top-down attention to nonemotional features. *American Journal of Psychiatry*, 169, 750–758.
- Williamson, S., Harpur, T. J., & Hare, R. D. (1991). Abnormal processing of affective words by psychopaths. *Psychophysiology*, 28, 260–273.
- Willoughby, M. T., Blair, C. B., Wirth, R. J., & Greenberg, M. (2012). The measurement of executive

function at age 5: Psychometric properties and relationship to academic achievement. *Psychological Assessment*, 24, 226–239.

- Wilson, K., Juodis, M., & Porter, S. (2011). Fear and loathing in psychopaths: A meta-analytic investigation of the facial affect recognition deficit. Criminal Justice and Behavior, 38, 659–668.
- Woodworth, M., & Waschbusch, D. A. (2008). Emotional processing in children with callous/unemotional traits. Child: Care, Health and Development, 34, 234–244.
- World Health Organization. (2010). International classification of diseases, tenth revision. Geneva: Author.
- Zahn-Waxler, C., & Radke-Yarrow, M. (1990). The origins of empathic concern. Motivation and Emotion, 14, 107–130.

# CHAPTER 21

# **Psychopathy in Women** Assessment, Manifestations, and Etiology

EDELYN VERONA JENNIFER VITALE

istorically, the study of psychopathy in women was all but ignored by psychopa-thologists and forensic psychologists. Hare's Psychopathy Checklist (PCL; Hare, 1980) and its revised version (PCL-R; Hare, 1991, 2003) were mostly validated in men, and it took several years for the study of female psychopathy to garner interest. Since the initial (2006) version of this chapter, work on female psychopathy has burgeoned exponentially, to the extent that there are now review articles on the topic (e.g., Dolan & Völlm, 2009; Edens, Campbell, & Weir, 2007; Forouzan & Cooke, 2005; Rogstad & Rogers, 2008). We provide in this chapter an updated comprehensive review of the existing literature, encompassing most types of research that have been conducted to understand psychopathy and related conditions in women. More specifically, we review and evaluate the growing literature on the (1) validity of the construct of psychopathy and measures of the construct as it is currently conceptualized in women; (2) evidence for potential gender-specific manifestations of psychopathy and related dimensions; and (3) distinct putative etiological factors contributing to psychopathic tendencies in women. In the course of reviewing this literature, we highlight similarities with and important departures from the male psychopathy literature. Our chapter

provides a survey of the literature, but more importantly, highlights important conceptual issues and fruitful directions to pursue in future research on female psychopathy.

# Early Work on Psychopathic Females

Although men may be more likely to present with psychopathy than women, Cleckley (1941/1976) included several female clientele among the prototype cases in his classic book on the topic, indicating that the full syndrome of psychopathy does occur in both genders. The female clients he described, notably, "Roberta" and "Anna," often exhibited many of the characteristics he had observed in his male clients (i.e., stealing, truancy, and pathological lying). At the same time, Cleckley also said of Roberta:

One of [Roberta's] most appealing qualities is, perhaps, her friendly impulse to help others. . . . She often went to sit with an ill neighbor, watched the baby of her mother's friend, and rather patiently helped her younger sister with her studies. In none of these things was she consistent. She often promised her services and, with no explanation, failed to appear. . . . She would stop to pet a puppy, take crumbs out to the birds, and comfort a stray cat. Yet, when her own dog was killed by an automobile, she showed only the most fleeting and superficial signs of concern. (p. 19)

This description of Roberta's shallow expressions of nurturance highlights potential distinctions between female and male expressions of psychopathic traits, or at least differences in how judgments of psychopathy are made in women and men. First, the primary traits of psychopathy are antithetical to female socialization more so than male socialization, and for this reason, the traits exhibited by Roberta may seem more striking to observers who expect women to be nurturant, selfless, and emotional. Second, the contexts in which women with psychopathy display these traits-within the home and in their relationships-often differ from the more public areas (e.g., pubs, gambling houses, business and military settings) in which psychopathic men wreak havoc.

In the decades following publication of the first edition of Cleckley's book, there was at least one notable exception to the lack of research on female psychopathy. Widom (1978) examined whether a subset of female prisoners fit the profile of the psychopath as described by Cleckley (1941/1976). Based on a cluster analysis of personality measures, she identified four offender subtypes in her sample of incarcerated women, including a category she referred to as a "psychopathic or undercontrolled type," exhibiting hostility and aggression, extensive criminal histories, and relatively low scores on anxiety. Although these offender groups resembled subtypes previously found in male delinquent samples (Megargee, 1966), a notable difference was that, although present in females, the undercontrolled and psychopathic types were less prevalent in female offender samples. A notable limitation is that the indices of psychopathy used in the Widom (1978) study reflected primarily the antisocial deviance aspects of the disorder as opposed to the affective-interpersonal features. In the following section, we review studies that have assessed features and correlates of psychopathy in women using specific, validated measures of the construct.

# Validity and Measurement of Female Psychopathy

From the mid-1990s through the early 2000s, Hare's PCL-R was the dominant psychopathy assessment tool (e.g., Fulero, 1995). As a result, most research on psychopathy in women over this time focused specifically on the generalizability of findings from studies using the PCL-R with men. More recently, however, the field has embraced alternative measures of the psychopathy construct, including measures designed for use with adolescents (e.g., Antisocial Process Screening Device [APSD]; Frick & Hare, 2001), and measures that can be used in noninstitutionalized populations (e.g., Psychopathic Personality Inventory [PPI, PPI-R]; Lilienfeld & Andrews, 1996). Given this increasing diversity in assessment methods, we need to consider issues related to the measurement of psychopathy in women across studies using the PCL-R and its direct variants (i.e., Psychopathy Checklist: Screening Version [PCL:SV], Psychopathy Checklist: Youth Version [PCL:YV]), research measures patterned after the PCL-R (e.g., APSD, Levenson Self-Report Psychopathy Scale [LSRP], Self-Report Psychopathy Scale [SRP-II, SRP-III]), as well as non-PCL-R measures (e.g., PPI). Descriptions of these various measures can be found in Hare, Neumann, and Mokros (Chapter 3), Salekin, Andershed, and Clark (Chapter 20), and Sellbom, Lilienfeld, Fowler, and McCrary (Chapter 10), this volume.

### Reliability and Factor Structure of the PCL-Based Measures in Female Offenders

Evidence for the utility of the PCL-R with female offenders was first reported in the initial edition of the PCL-R manual (Hare, 1991). The unpublished data in the manual generally supported the use of the measure in female samples, with interrater reliabilities similar to those reported in male samples and indices of scale homogeneity (internal consistency) only slightly lower than those reported for men (e.g., coefficient alpha in female samples ranging from .77 to .79, compared with .83 to .91 in male samples). When reported, published results (e.g., Vitale, Smith, Brinkley, & Newman, 2002; Warren et al., 2003; Weizmann-Henelius, 2006; Weizmann-Henelius et al., 2010) have been similar, with high interrater and internal consistency reliabilities comparable to those for male samples (e.g., .87–.89).

To demonstrate the generality of PCL-based psychopathy measures across gender, however, it is necessary also to consider the comparability of instrument structure and item functioning. To the extent that an instrument functions differently across participant groups, it becomes increasingly difficult to draw conclusions regarding the validity of the construct being assessed (Sue, 1999). Studies of the generalizability of factor structure across gender have been complicated by ongoing debate surrounding alternative factor models for the PCL-R and PCL-based measures (e.g., PCL:YV, PCL:SV, SRP). Specifically, although the twofactor model is still widely used in research, unquestioned early acceptance of a two-factor model in males (Hare, 1991; Harpur, Hare, & Hakstian, 1989) has been replaced by competing three-factor (Cooke & Michie, 2001) and four-factor/facet models (Hare, 2003; Hare et al., Chapter 3, this volume).

Nonetheless, factor-analytic research with females has produced results generally consistent with the male literature. For example, consistent with some studies in males (Cooke & Mickie, 2001), studies comparing the two-factor versus three-factor models in women using the PCL-R (Warren et al., 2003; Weizmann-Henelius et al., 2010), the PCL:SV (Skeem, Mulvey, & Grisso, 2003; Strand & Belfrage, 2005), and the PCL:YV (Kosson et al., 2013) have shown better fit for the three-factor model than for the two-factor model. Similarly, although adequate model fit has been demonstrated for the two-factor model in female samples for both the PCL-R (e.g., Kennealy, Hicks, & Patrick, 2007; Warren et al., 2003) and the PCL:SV (Rogers et al., 2000), Lester, Salekin, and Sellbom (2013) demonstrated poor fit for the twofactor model in a study of the SRP-II in a predominantly female (i.e., 69.1%) undergraduate sample. Finally, while there is also support for the utility of four-facet models in women, as with men (Kennealy et al., 2007; Lester et al., 2013; Schrum & Salekin, 2006), in the few direct comparisons, the three-factor model has shown better fit than the four-facet model (Kosson et al., 2013; Warren et al., 2013).

Even when model fit is adequate, however, there may still be important differences in the properties of individual PCL-R items. For example, in one of the first of studies of the generalizability of the two-factor model across gender, Salekin, Rogers, and Sewell (1997) showed that although a two-factor structure similar to that originally proposed by Harpur and colleagues (1989) emerged in their sample of 103 female prisoners, the individual items of the PCL-R did not load on these factors in the same way for women as they had for men. Specifically, the items "poor behavioral controls," "impulsivity," and "lack of realistic longterm goals" cross-loaded on Factors 1 and 2, and the items "failure to accept responsibility," "many short-term marital relationships," and "revocation of conditional release" failed to load on either factor (Salekin et al., 1997).

In a study of the PCL:YV in adolescent female offenders, Schrum and Salekin (2006) used item response theory (IRT) analyses to examine scale performance across gender. They found differences relative to male samples in the ability of specific items to discriminate psychopathy (e.g., juvenile delinquency was a better discriminator in the female sample). Furthermore, while overall similarity to male samples was evident, with the interpersonal and affective items most discriminating of the underlying construct, the affective items tended to outperform the interpersonal items in males, whereas the interpersonal items outperformed the affective items in females (Schrum & Salekin, 2006).

Bolt, Hare, Vitale, and Newman (2004) also investigated the functioning of the PCL-R in female samples using IRT analyses. Unlike Schrum and Salekin (2006), however, Bolt and colleagues (2004) included multiple samples in their analyses, which enabled them to examine differential item functioning (DIF). When differences in relationships between an item and the latent construct occur across samples, the item is said to exhibit DIF. If a large proportion of the items display substantial amounts of DIF, the validity of the instrument may be called into question across the groups being compared. Analyses of the PCL-R item scores of females versus males demonstrated the presence of DIF for 12 items (Bolt et al., 2004). Although a number of items showed significant DIF, there was a split between those exhibiting positive DIF (five items) and those showing negative DIF (seven items), resulting in a limited net effect on total scores. The largest differences were found for the items "early behavior problems," "juvenile delinquency," and "criminal versatility," on which women scored lower than men at the same latent level of psychopathy, and for the item "conning/manipulative," on which women scored higher than men at the same latent level of psychopathy. Overall, the results of Salekin and colleagues (1997), Schrum and Salekin (2006), and Bolt and colleagues (2004) suggest that when the PCL-R and PCL:YV are used with female samples, there may be some differences in item functioning, particularly for items tapping antisocial or criminal behavior.

In summary, the results of factor analyses and IRT analyses suggest that there are some differences in the item and test functioning of the PCL-R and PCL:YV between males and females. However, these differences typically involve antisocial items, and the effects of these differences on total scores are likely to be minimal. Thus, it may be argued that these results indicate strong similarity of measurement properties (general scalar equivalence) for the PCL-R across gender.

#### Prevalence Rates and Mean Differences

Although a small number of studies show base rates of psychopathy in women similar to those in men when the PCL-R and the traditional cutoff score of 30 are used (i.e., ~31%; Louth, Hare, & Linden, 1998; Tien, Lamb, Bond, Gillstrom, & Paris, 1993), the majority of studies using PCLbased measures (i.e., PCL-R, PCL:YV, PCL:SV) with female offenders have found lower rates of psychopathy relative to male offenders (e.g., Jackson, Rogers, Neumann, & Lambert, 2002; Loucks, 1995; O'Connor, 2001; Salekin et al., 1997; Schrum & Salekin, 2006; Strand & Belfrage, 2005; Vitale et al., 2002; Warren et al., 2003; Warren & South, 2006; Weizmann-Henelius, 2006; Weizmann-Henelius et al., 2010). In these studies, reported prevalence rates for female offender samples was as low as 6% (Jackson et al., 2002), with several falling between 11 and 17% (e.g., Loucks, 1995; O'Connor, 2001; Salekin et al., 1997; Strand & Belfrage, 2005; Warren et al., 2003; Warren & South, 2006).

In an unpublished dissertation focusing on residents of a federal prison for women, O'Connor (2001) reported a base rate of 15.5% for PCL-R psychopathy using the standard score of 30 as a cutoff. However, he also examined the effectiveness of differing PCL-R diagnostic cutoff scores using receiver operating characteristic (ROC) curves (i.e., plot of true-positive rate [sensitivity] as a function of the false-alarm rate [one minus specificity]) and Cleckley's (1941/1976) original ratings as criteria for group membership. The cutoff score on the PCL-R that produced the most comparable diagnostic efficiency between Hare's (1991) normative male offender sample and O'Connor's (2001) sample of female prisoners was 27 (sensitivity = .74, specificity = .90), which produced a base rate for psychopathy of 24%. The use of similar analyses in other studies of the PCL-R and PCL:SV support the assertion that a female's score on these psychopathy measures is likely to be approximately two points lower than a male's at an equivalent level of psychopathy (Bolt et al., 2004; Cooke & Michie, 2001).

Although differences in base rates are important to the question of measurement equivalence and also clinical application (e.g., Forouzan & Cooke, 2005), researchers have shifted in recent years toward a dimensional conceptualization of psychopathy, with less emphasis on diagnostic cutoff scores (e.g., Walters et al., 2007). Even when dimensional scores are used, however, differences in the mean scores for males and females have been observed in institutionalized samples using the PCL-R (e.g., Rutherford, Cacciola, Alterman, & McKay, 1996; Weiler & Widom, 1996; Weizmann-Henelius et al., 2010; but see Cooney, Kadden, & Litt, 1990; Stafford & Cornell, 2003) and the PCL:SV (Forth, Brown, Hart, & Hare, 1996), in undergraduate and noninstitutionalized samples using the SRP-II and SRP-III (Lilienfeld & Hess, 2001; Miller, Watts, & Jones, 2011; Wilson, Frick, & Clements, 1999; Zagon & Jackson, 1994), and the LSRP (Marion & Sellbom, 2011), and in adolescent samples using the APSD (Kimonis, Frick, Fazekas, & Loney, 2006). In contrast, although Lilienfeld and Andrews (1996) and Lilienfeld and Hess (2001) observed significantly lower scores on the PPI for females relative to males in their college-age samples, Hamburger, Lilienfeld, and Hogben (1996) found no significant gender difference in PPI scores in a similar sample. Other studies have similarly reported mean PPI scores for females similar to those for males (e.g., Berardino, Meloy, Sherman, & Jacobs, 2005; Chapman, Gremore, & Farmer, 2003). One possibility is that the differences in mean scores across gender for many psychopathy measures result in part from gender differences in overall levels of antisocial and/or violent behavior. To the extent that any particular measure emphasizes the antisocial and violent behaviors related to psychopathy, it may then exaggerate differences across gender. Thus, it may be the case that on measures such as the PPI, which place less emphasis on such behaviors, differences in mean scores are less likely to arise.

# **Correlates of Psychopathy in Females**

Of course, differences in prevalence or mean scores do not necessarily reflect broader fundamental differences in the psychopathy construct in women (Forouzan & Cooke, 2005). Most researchers would agree that in assessing the construct's equivalence across gender, it is necessary to consider not only the structure and function of the test items and measures but also their correlates.

### Personality Correlates

Theoretical and empirical approaches to male psychopathy have historically emphasized the associations between psychopathy and the personality factors of constraint and socialization (e.g., Benning, Patrick, Hicks, Blonigen, & Krueger, 2003; Hare, 1978). Research with incarcerated females and using a variety of psychopathy measures has provided evidence that these important relations generalize across gender. Incarcerated women show negative correlations between the PCL-R and Gough's (1969) Socialization scale from the California Psychological Inventory (Vitale et al., 2002), and the Constraint factor of Tellegen's (1982) Multidimensional Personality Questionnaire (Kennealy et al., 2007; Vitale et al., 2002). Likewise, research has confirmed expected negative correlations for the PPI and SRP with the Conscientiousness factor of the five-factor model (Derefinko & Lynam, 2006), and positive correlations for these psychopathy scales with measures of impulsivity, angry hostility, and excitement seeking in women (e.g., Derefinko & Lynam, 2006; Lester et al., 2013; Miller et al., 2011).

Other studies have shown that psychopathy in female samples is associated with personality measures selected to index the glib, grandiose, callous, and unempathic characteristics emphasized in clinical descriptions of psychopathic individuals. For example, PCL-R scores in women have been associated with poor perspective taking and a lack of empathic concern (Rutherford et al., 1996). Zagon and Jackson (1994) reported significant positive relations between SRP-II scores and measures of narcissism, social desirability, and lying, and significant negative relations between SRP-II scores and anxiety measures in both male and female undergraduates. A negative association between SRP-II scores and questionnaire-assessed empathy was significant only for females in this study, and other studies have reported significant negative associations for the interpersonal-affective dimension of the SRP with affective empathy and empathic concern in college women (Seara-Cardoso, Dolberg, Neumann, Roiser, & Viding, 2013). In a sample of juvenile offenders, Forth and colleagues (1996) reported that the PCL:SV was positively correlated with self-ratings of Arrogance, Calculation, and Dominance, and negatively correlated with ratings of Love and Affection for participants of both genders. However, PCL:SV scores were correlated to a significant negative degree with scores on the Unassuming and Ingenuous scales among women, but not men, in this study. Furthermore, despite Cleckley's (1941/1976) hypothesis that psychopathy entails an underlying deficit in emotion, Louth and colleagues (1998) found that PCL-R Factor 1 features were unrelated to problems in understanding and recognizing emotional states, as measured by the Toronto Alexithymia Scale (TAS; Taylor, Ryan, & Bagby, 1985), in a female offender sample; in contrast, the antisocial and unstable behaviors comprising PCL-R Factor 2 were related positively to alexithymia scores.

Finally, Marion and Sellbom (2011) investigated possible test bias across gender in the criterionrelated validity of the LSRP. The authors utilized LSRP total and subscale scores, along with data for a variety of external criterion measures (i.e., antisocial behavior, emotional empathy, sensation seeking, narcissism, impulsivity, aggressiveness, and disconstraint), obtained from both male and female samples. Analyses showed that although there was no evidence for slope bias between the genders (i.e., the magnitude of associations for the LSRP with various criterion measures did not differ as a function of gender), some limited evidence for intercept bias was found (Marion & Sellbom, 2011). Specifically, the same score on the LSRP suggested a higher level of psychopathy, as indexed by differing criterion variables, for men relative to women. Importantly, however, the authors noted that in instances when intercept bias was evident, the effect was small and tended to occur for external criteria for which gender differences have been documented in prior work.

Considered as a whole, findings from existing studies of personality correlates indicate that abnormalities in the experience and expression of emotion and empathy, as indexed by self-report, and deficits in perceived self-control and socialization, are characteristic of both males and females who score high on psychopathy inventories.

### Clinical–Behavioral and Violence Correlates

Studies with male samples have consistently revealed significant relations between psychopathy measures and a variety of clinical-behavioral criterion measures, including poor treatment response, criminal behavior, poor institutional adjustment, alcoholism, and recidivism (Catchpole & Gretton, 2003; Dolan & Doyle, 2000; Hare, 1999; Hemphill, Templeman, Wong, & Hare, 1998; Ogloff, Wong, & Greenwood, 1990; Walters, 2003). However, investigations of these variables in female samples have yielded less consistent results. For example, Salekin and colleagues (1997) reported a nonsignificant association in a general female offender sample between PCL-R ratings and scores on the Treatment Rejection scale of the self-report-based Personality Assessment Inventory (Morey, 1991). In contrast, Richards, Casey, and Lucente (2003) found that high PCL-R-assessed psychopathy predicted poor treatment response, including noncompliance, poor attendance, violent rule violations, and avoidance of urinalysis testing in female offenders with substance use problems (N = 404).

Findings regarding the association between psychopathy and antisocial behavior in women have also been somewhat mixed. Some studies with female samples, most using the PCL-R, have reported significant correlations between psychopathy scores and violence in and out of prison (e.g., Kennealy et al., 2007; Miller et al., 2011; Vitale et al., 2002; Weiler & Widom, 1996; Weizmann-Henelius, 2006), as well as nonviolent crime (Kennealy et al., 2007; Warren & South, 2006; Warren et al., 2005). However, using the PCL:SV in a sample of 103 female offenders, Rogers and colleagues (2000) found that Factor 1 scores correlated significantly with verbal aggression only, and Factor 2 scores correlated significantly with physical aggression only-with r's for each factor with aggression of the other type falling short of significance. Along similar lines, Odgers, Reppucci, and Moretti (2005) and Warren and colleagues (2005) found only weak associations for psychopathy scores (PCL:YV and PCL-R, respectively) with criterion measures of aggression and violence in their samples of incarcerated females.

Few studies have compared males and females directly. In the two studies that have done so, Pechorro and colleagues (2013) found significant gender differences in the associations between APSD scores and both self-reported delinquency and crime severity among incarcerated juveniles, with the relationship in both cases being weaker for females than for males. In the other, which tested for gender differences in links between intimate partner violence (IPV) and psychopathy, Mager, Bresin, and Verona (2014) found that associations for Factor 1 and Factor 2 of the PCL:SV with IPV and mutual relationship violence, respectively, were weaker in female than in male community-dwelling offenders.

What about the prediction of future violence? In one of the earliest studies of psychopathy and recidivism in an adult female offender sample, Salekin, Rogers, Ustad, and Sewell (1998) concluded that when female prisoners were classified as either psychopathic or nonpsychopathic on the basis of a cutoff score of 30 on the PCL-R, the classification accuracy of the PCL-R as a predictor of recidivism was "modest to poor" (p. 124), with a high rate of false positives and false negatives, although this result may have been due to recidivism rates for female psychopaths in this study being lower than is typical for men (~50 vs. 63%). Consistent with this finding of weak prediction of future violence, Salekin and colleagues (1997) reported no significant associations between PCL-R scores and correctional officer ratings of female offenders' subsequent violent behavior, verbal aggression, or noncompliance within the prison institution. Edens and colleagues (2007) conducted a meta-analysis of the relationship between psychopathy as indexed by PCL measures (PCL, PCL-R, PCL:YV) and recidivism among juvenile offenders. Consistent with the result of Odgers and colleagues (2005), the mean effect size for violent recidivism in female samples was nonsignificant and lower than the mean effect size for male samples. Similarly, with one exception, the effect sizes for general recidivism from studies involving female samples were small and nonsignificant.

The inconsistent findings across gender regarding associations of psychopathy with violent offending and general criminal behavior may reflect broader inconsistencies in the development of antisocial and aggressive behavior across gender. Assessment instruments for psychopathy often include items pertaining to violent and aggressive acts, and place particular emphasis on the presence of such behaviors in early childhood and adolescence.

### **Developmental Correlates**

Evidence of differing developmental trajectories for antisocial behavior (e.g., life-course-persistent vs. adolescent-onset) has been reported in both genders (Moffitt, 2003). Similarly, existing research suggests that developmental precursors to psychopathy, including callous-unemotional (CU) traits, although observed at lower rates in girls than boys (Essau, Sasagawa, & Frick, 2006), show similar construct validity across girls and boys (e.g., Essau et al., 2006; Pardini, Lochman, & Frick, 2003; Viding, Frick, & Plomin, 2007). CU traits, often measured with the APSD (Salekin, Andershed, & Clark, Chapter 20, this volume) or the Inventory of Callous-Unemotional Traits (Viding & Kimonis, Chapter 7, this volume), have been similarly linked to more severe relational and conduct problems in girls and boys (Essau et al., 2006). These findings indicate that tendencies toward psychopathy and risk factors for persistence can be detected early in life (i.e., in childhood) in both girls and boys.

Some theorists speculate that girls begin acting antisocially mainly in adolescence and rarely in childhood (Silverthorn & Frick, 1999), and that girls with adolescent-onset antisocial behavior have similar outcomes and prognosis as boys with early-onset antisociality. This perspective has not yet received empirical support, especially as earlyonset girls have in fact been identified, particularly in ethnically diverse and urban samples (e.g., White & Piquero, 2004). However, a number of large-scale studies in the United Kingdom, the United States, and Canada have noted that girls are more likely to exhibit a later onset of conduct problems, with lower prevalence of aggression (e.g., Kim-Cohen et al., 2005; Silverthorn & Frick, 1999). Indeed, the lower rates of antisocial personality disorder (ASPD) in female prisoners can be attributed to the lower prevalence of diagnosable conduct disorder when they were girls (Burnette & Newman, 2005), so that antisocial behavior is postdicted less by childhood conduct problems in women than in men. Additionally, some work has shown that childhood symptoms of ASPD relate significantly to Factor 1 scores in men but not in women substance users (Rutherford, Alterman, Cacciola, & McKay, 1998). However, no study has examined the prospective links between child conduct problems, CU traits, and later psychopathy in girls or women relative to preliminary evidence that exists in men (cf. Lynam, Caspi, Moffitt, Loeber, & Stouthammer-Loeber, 2007).

Additionally, developmental researchers have argued that males and females differ more in the quality of their aggressive behavior (i.e., specific forms in which they engage) than in the quantity of such behavior (Bjorkqvist, Osterman, & Kaukianen, 1992; Lagerspetz, Bjorkqvist, & Peltonen, 1988), and that this may complicate the study of aggressive behavior in girls. The term "relational aggression" has been used in reference to more covert forms of aggression (e.g., gossip, refusal of friendship, ostracism) that aim to cause harm by disenfranchising the victim from the social group (Crick & Grotpeter, 1995). There is evidence that relational aggression is implicated in female manifestations of antisocial traits. For example, Werner and Crick (1999) reported that relational aggression in college women predicted high levels of peer rejection, antisocial behavior, stimulus seeking, egocentricity, borderline personality disorder (BPD)-related symptoms, and bulimic symptomatology. In men, relational aggression predicted peer rejection and egocentricity only. However, studies examining associations between psychopathic traits and relational aggression are few in number and mixed in terms of findings. While Marsee, Silverthorn, and Frick (2005) reported larger correlations between APSD scores and relational aggression in girls than boys, Penney and Moretti (2007) found no gender differences in relationships for PCL:YV scores with relational aggression, overt aggression, or violence directed toward parents, partners, or peers. In adults, at least two studies of college students (Czar, Dahlen, Bullock, & Nicholson, 2011; Schmeelk, Sylvers, & Lilienfeld, 2008) have uncovered few to no gender differences in relations between psychopathy traits and relational aggression.

In summary, preliminary evidence suggests that childhood conduct problems may not be as common a precursor of adult antisocial behaviors and psychopathic traits in women as in men, at least in cross-sectional studies (e.g., Rutherford et al., 1998). Gender differences in the development of aggression and conduct problems may contribute to differences in the base rates of psychopathy across gender, as well as the construct's apparently less powerful prediction of violent behavior in female as compared to male samples.

# Psychopathology Correlates

Many studies have confirmed that incarcerated women experience higher rates of psychopathology compared to matched community women (Jordan, Schlenger, Fairbank, & Cadell, 1996) and incarcerated men (Teplin, Abram, & McClelland, 1996). Additionally, incarcerated women show *lower* rates of ASPD than male prisoners (Fazel & Danesh, 2002; Jordan et al., 1996), and are more likely than men in prison to be diagnosed with BPD (Black et al., 2007; Hurley & Dunne, 1991). Only a few studies have formally examined associations between psychopathy per se and other forms of psychopathology in women. Furthermore, most of these studies (though not all) include only women, precluding direct gender comparisons.

# *Externalizing and Personality Disorder Correlates*

Although Piotrowski, Tusel, Sees, Banys, and Hall (1995) found that PCL-R scores were related to an ASPD diagnosis in male but not female methadone patients, Rutherford and colleagues (1998) reported similar correlations for PCL-R total and factor scores with ASPD criteria in women and men. In a female offender sample, Warren and colleagues (2003) reported that Factor 2 of the PCL-R was significantly correlated with all Cluster B personality disorders (ASPD, BPD, histrionic and narcissistic personality disorders) and also paranoid personality disorder, whereas Factor 1 was negatively related to avoidant personality disorder. Logan and Blackburn (2009) found that PCL-R scores were associated with the number of concurrent personality disorder diagnoses in a sample of violent female offenders in the United Kingdom, and the arrogant-deceitful interpersonal facet of the PCL-R in particular was correlated with narcissistic, histrionic, and ASPD traits. However, there was no relationship between psychopathy and BPD traits in this sample of women. In contrast, in an article that included data from two studies involving college students and clinical forensic samples, Sprague, Javdani, Sadeh, Newman, and Verona (2012) reported a stronger relationship between psychopathy and BPD in women than in men, with women high on Factor 1 showing the strongest association between Factor 2 and BPD symptoms.

Surprisingly little research has examined substance use and psychopathy in women. Consistent with prior findings in men (see Ellingson, Littlefield, Vergés, & Sher, Chapter 26, this volume), Kennealy and colleagues (2007) reported significant relationships between PCL-R Factor 2 scores and use of a variety of illicit substances, whereas Factor 1 was related positively to opiate use only, and negatively to total drug use. A recent study of individuals from the community with histories of criminal behavior and recent substance abuse (Schultz, Murphy, & Verona, 2016) found that PCL:SV scores were more strongly related to illicit drug use indicators in women than in men, with Factor 1 being more protective and Factor 2 being more promotive for substance abuse in women than men.

In summary, patterns of comorbidity involving DSM personality disorders and substance use appear similar across women and men. Factor 2 of psychopathy, in particular, is consistently associated with externalizing spectrum disorders (ASPD, substance use) in both men and women. However, these relationships may be stronger in men, consistent with the literature on psychopathy and antisocial behavior/recidivism reviewed earlier. The exception would be the associations between psychopathy with BPD, which may be stronger in women, although more research is needed to confirm this.

### Internalizing Disorders and Self-Harm Correlates

Findings are fewer and more mixed when it comes to internalizing disorder correlates. An early study by Vitale and colleagues (2002) failed to find significant relationships between PCL-R total scores and scores on the Beck Depression Inventory, the Beck Anxiety Inventory, or the Symptom Checklist-90—Revised global functioning scale in a large sample of female inmates. In a more recent study of German detained youth (N = 214), Sevecke, Lehmkuhl, and Krischer (2009) reported that male, but not female, youth showed negative relationships between PCL:YV-assessed psychopathy traits and internalizing symptoms (i.e., anxiety/depression). However, these gender differences were not found in another study of mostly Swedish youth undergoing treatment for substance use problems (Hemphala & Tengstrom, 2010). Furthermore, Essau and colleagues (2006) reported that CU traits were associated positively (not negatively) with internalizing symptoms in girls, but not boys.

Other studies focusing on suicide-related outcomes have typically reported positive associations between Factor 2 and suicide risk in both men and women, although associations for Factor 1 with suicide risk have been more variable (Douglas et al., 2008; Verona, Hicks, & Patrick, 2005; Verona, Patrick, & Joiner, 2001). The limited evidence suggests gender differences, with one study using a combined clinical-community sample showing stronger protection against suicidal behavior as a function of high CU traits in female than in male youth (Javdani, Sadeh, & Verona, 2011), and another study of individuals with criminal histories showing elevated suicide risk as a function of scores on both PCL:SV factors in women but not men (Verona, Sprague, & Javdani, 2012). In a study of German youth (Sevecke et al., 2009), suicidality was related positively to PCL:YV total and facet scores in females but not males. Consistent with these two latter studies, both Factor 1 and Factor 2 subscales of the SRP-III were positively related to nonsuicidal self-injury in female college students, whereas only Factor 2 subscales were related to such behavior in male college students (Miller et al., 2011). Thus, there is growing evidence that psychopathic traits, including those associated with Factor 1, may relate to greater risk for self-directed violence in women but not men.

Finally, Blonigen, Hicks, Krueger, Patrick, and Iacono (2005) examined etiological associations between psychopathic traits assessed in terms of personality-estimated PPI factors (Impulsive Antisociality and Fearless Dominance) and broad spectra of psychopathology (internalizing, externalizing) in a large sample of adolescent twins from the community. They reported positive genetic correlations for PPI Impulsive Antisociality with externalizing symptoms in participants of both genders. In addition, Impulsive Antisociality showed a positive genetic correlation with internalizing symptoms in females but not males, and PPI Fearless Dominance showed a positive genetic correlation with externalizing symptoms in male but not female participants.

In summary, there is a growing body of work suggesting that psychopathic traits may not be protective for some types of internalizing problems, particularly suicidality and self-harm, in women compared to evidence for the protective role of these traits in men. In turn, these findings appear consistent with theorizing that impulsivity and aggression may be more likely manifested as self-directed violence and self-harm in women than in men (Forouzan & Cooke, 2005; Sadeh, Javdani, Finy, & Verona, 2011). The findings of Blonigen and colleagues' (2005) behavior genetic study provide particularly compelling evidence that underlying dispositions toward psychopathy may be expressed differently in women and men.

# Manifestations of Psychopathy in Women

A vivid illustration of how psychopathy may be manifested differently in women comes from the Hollywood portrayal of an obsessive and violent woman in the 1987 movie Fatal Attraction. Glenn Close's character in this film exhibits psychopathic-like traits, including manipulation, impulsivity, violence, and lack of empathy; however, she manifests these traits in an effort to prevent abandonment by a romantic partner and to annihilate her perceived romantic rival. Indeed, empirical data suggest that violence among women is more likely to occur in the home and toward intimates (Robbins, Monahan, & Silver, 2003), and women with ASPD diagnoses are more likely than male counterparts to be irresponsible as parents, to engage in prostitution, and to have been physically violent against sex partners and children (Goldstein, Powers, McCusker, & Mundt, 1996). These findings highlight differences in the contexts in which the same underlying propensity (antisocial or psychopathic traits) may be manifested in women as compared to men (e.g., domestic settings vs. work or external social milieux).

This conceptualization aligns with early work advancing the view that certain clinical conditions (e.g., histrionic personality disorder, somatization disorder) may represent uniquely female expressions of "sociopathy" or psychopathy (e.g., Cloninger & Guze, 1970, 1973; Lilienfeld, 1992). The observed high intrafamilial association between sociopathy, typically operationalized as criminal and aggressive behaviors, and histrionic personality disorder or somatization disorder was cited as support for this argument (e.g., Cadoret, 1978; Cloninger, Reich, & Guze, 1975). Despite initial evidence that PPI-assessed psychopathic traits were more strongly related to histrionic personality and somatization symptoms in college women than in men (Hamburger et al., 1996; Lilienfeld & Hess, 2001), more recent work has failed to replicate these findings in college students using the PPI (Cale & Lilienfeld, 2002; Wilson et al., 1999) or in female inmates using the PCL-R (Salekin et al., 1997).

In contrast, the recent studies mentioned earlier indicate that women scoring high on both Factor 1 and Factor 2 of the PCL:SV show more BPD symptoms, whereas among men, Factor 2 is related to BPD regardless of levels of Factor 1 or its facets (Sprague et al., 2012). These newer studies do not necessarily indicate that psychopathy and BPD are expressions of the same vulnerability in women, although the two conditions may indeed overlap etiologically. It is possible that rater bias or lack of item specificity lead to symptoms of these two disorders being conflated in women (e.g., women high on BPD may rely more on manipulation to cope with relational stress, leading them to be rated higher on Factor 1 traits). Either way, it seems likely that women participants with high scores concurrently on psychopathy and BPD in these study samples represent the secondary subtype of psychopathy more so than the primary variant documented empirically over the past few decades (see Hicks & Drislane, Chapter 13, this volume). In particular, cluster-analytic work with female prisoners has shown that a "secondary" variant of psychopathy in women is likely to exhibit greater mental health and suicidal symptoms than in either primary psychopathic or nonpsychopathic women (Hicks, Vaidyanathan, & Patrick, 2010).

A recent prototypicality study using the Comprehensive Assessment of Psychopathic Personality (CAPP; Cooke & Logan, Chapter 9, this volume) is particularly enlightening in regard to potentially distinct manifestations of psychopathy in women and men, at least as perceived by professionals. In this study, Kreis and Cooke (2011) found some minor but important gender differences in specific item endorsements by mental health professionals who work with women exhibiting high levels of psychopathy. Specifically, symptoms involving emotional instability, unstable self-concept, and manipulativeness were seen as more prototypical of female than male psychopathy. Regardless of whether etiological processes are similar across male and female psychopathy, health professionals and correctional personnel perceive psychopathic women as more dysregulated and manipulative, as well as more flirtatious/sexualized (Forouzan & Cooke, 2005). These impressions were corroborated by female participants themselves in another study involving a large sample of Croatian nonreferred adolescent boys and girls (Rucevic, 2010). In this study, high scores on the Youth Psychopathic Traits Inventory (Andershed, Kerr, Stattin, & Levander, 2002) were associated with greater delinquency in boys than in girls, whereas sexual risk taking was more prominent in high-psychopathy girls than in boys. However, these gender differences were specific to the impulsive-irresponsible features of psychopathy.

In summary, there is some evidence that psychopathy, at least the secondary subtype, is manifested in more emotionally dysregulated ways (e.g., BPD, suicidality) and within more intimate interpersonal contexts (e.g., domestic interactions, sexuality) among female compared to male offenders. Further research is needed to test for differences in the expression of primary psychopathy or Factor 1 traits (e.g., manipulativeness) in women relative to men, and to evaluate the possibility of gender biases in how certain items apply to women, or in how diagnosticians rate them when assessing women.

# **Putative Mechanisms**

In the subsections that follow, we review existing research that has examined putative etiological processes that may contribute to the emergence of psychopathy in women. It should be noted that although the assumption is often made that these processes are involved in the development of psychopathy or related traits, most of this research has neither been prospective nor established temporal progression.

### Hormones and Neurotransmitters

Hormonal and neurochemical differences between men and women may be one important factor contributing to the differential prevalence of antisocial personality and psychopathy across the genders. Androgen hormones, such as testosterone, have been implicated in aggressive and antisocial behavior (e.g., Olweus, Mattson, Schalling, and Low, 1988), as well as in psychopathy (Yildrim & Derksen, 2012). Research on girls exposed prenatally to high levels of androgens suggest that they are more prone to be "tomboys" and display increased rough-and-tumble play activity as children (Meyer-Bahlburg & Ehrhardt, 1982); however, they do not display heightened levels of aggression during adulthood compared to other girls (Benton, 1992). In other work, van Honk and colleagues (1999, 2004) found that women with high levels of testosterone or those administered a single dose of testosterone exhibited enhanced vigilance to angry faces, as well as psychopathic-like deficits in decision making (i.e., relative insensitivity to punishment cues and higher reward dependence) within the Iowa gambling task (Bechara, Damasio, Damasio, & Anderson, 1994). These studies, however, did not include direct assessment of psychopathic tendencies in the women who were tested.

Other research has implicated reductions in secretion of the stress hormone cortisol in disruptive behaviors in youth, including those with CU traits (e.g., Hawes, Brennan, & Dadds, 2009). An initial series of studies suggested that this was the case mostly for males (Loney, Butler, Lima, Counts, & Eckel, 2006; O'Leary, Loney, & Eckel, 2007), but more recent work by the same group reported that women in the luteal phase also showed the association between low cortisol and psychopathic traits (O'Leary, Taylor, & Eckel, 2010).

With regard to neurochemistry, human studies have demonstrated reliable relationships between less efficient or dysregulated serotonin (5-HT) neurotransmitter functioning and aggression, alcoholism, and criminality (see review by Roy, Virkkunen, & Linnoila, 1990). There is preliminary evidence that Factor 1 or CU traits, however, are associated with more efficient 5-HT functioning (Dolan & Anderson, 2003; Sadeh, Javdani, & Verona, 2013; Sadeh et al., 2010). No research has yet examined 5-HT links to psychopathy in women, although some evidence from studies on aggression and antisociality suggests gender differences in associations of these outcomes with 5-HT dysregulation (e.g., Manuck et al., 1999; Verona, Joiner, Johnson, & Bender, 2006). However, the existing studies are too few, and have not been replicated adequately, to permit strong conclusions.

### Heritability

Although the polygenic multiple threshold model (Cloninger et al., 1975; Cloninger, Christiansen, Reich, & Gottesman, 1978) suggests that women who express psychopathic features must have greater genetic dosage than males who express such tendencies, a review of twin studies evaluating the heritability of general antisocial, criminal, and aggressive behaviors did not find clear evidence for gender differences (Rhee & Waldman, 2002). Additionally, genealogical studies show that familial influences contributing to the development of antisocial personality appear largely the same in men and women (Cloninger et al., 1978). However, Rhee and Waldman (2002) cautioned that the fact that females may require more liability (either genetic or environmental) to express antisocial behavior does not mean that genetic influences are necessarily of greater magnitude in females than in males.

Consistent with this, twin data analyses using PPI-estimated psychopathy scores have revealed no sex differences in the magnitude of estimates of genetic and environmental influences on total psychopathy or the two factors (Blonigen et al., 2005). In a study using an adopted cohort (N = 278), Beaver, Rowland, Schwartz, and Nedelec (2011) found that the biological father's but not the mother's criminal history (i.e., incarceration) was related to personality-estimated psychopathic traits in male but not female respondents. However, given the modest sample size in this work, the questionable measure of genetic risk (i.e., incarceration history of biological parent as reported by the participant), and the fact that analyses failed to directly compare estimates for men and women, these results should be considered very preliminary. Nonetheless, another study involving adolescent twins did find evidence of quantitative gender differences in heritability of CU traits, with girls showing lower heritability and higher contribution of shared environment than boys (Viding et al., 2007).

In summary, as with findings pertaining to the heritability of general externalizing proneness (e.g., Krueger et al., 2002), there is no strong evidence for gender differences in heritability of adult psychopathy, although CU traits assessed at younger ages may show gender differences in heritability.

# Adverse Background and Childhood Abuse

Research findings suggest that trauma and adversity-particularly exposure to childhood maltreatment (White & Widom, 2003)-may exert a stronger influence on externalizing problems in women than in men (e.g., Capaldi & Clark, 1998). However, very few studies have been conducted on psychopathy and even fewer have examined gender differences. In a sample of female federal prisoners, Verona and colleagues (2005) found that a history of childhood physical and sexual abuse was associated with higher PCL-R Factor 2 scores, but was unrelated to Factor 1 scores, similar to findings in men (e.g., Poythress, Dembo, Wareham, & Greenbaum, 2006). Weiler and Widom (1996) found no gender differences in longitudinal relationships between childhood abuse and/or neglect and PCL-R psychopathy scores, with both men and women with abuse histories showing higher scores than nonabused individuals. Krischer and Sevecke (2008) reported that relationships between physical trauma and PCL:YV total scores were evident in legally detained boys but not in detained girls. Among girls in this study, psychopathic traits were related to placement in foster care. Thus, although some studies corroborate the idea that childhood maltreatment has larger effects on general antisociality and externalizing outcomes in females (Capaldi & Clark, 1998; White & Widom, 2003), most of these studies have not been prospective. Also, too few have examined links between primary psychopathic traits and maltreatment to permit firm conclusions regarding the differential role of childhood maltreatment and psychopathy in women.

In summary, only limited research has been conducted to clarify whether putative biological or environmental mechanisms are similarly related to female and male psychopathy. This is an area requiring further work.

# Laboratory Findings on Female Psychopathy

Laboratory research with male participants (prisoners in particular) has revealed consistent deficits in specific emotional, attentional, and regulatory processes among those high in psychopathy (e.g.,
Newman, Curtin, Bertsch, & Baskin-Sommers, 2010; Patrick, Bradley, & Lang, 1993). The following section reviews findings from parallel studies with women.

#### Affective Processing Deficits

In view of Cleckley's (1941/1976) observation that psychopaths lack the normal range and depth of emotion, numerous studies have been conducted to assess deficits in affective responding among psychopathic compared with nonpsychopathic individuals, especially using fear-potentiated startle (FPS) paradigms. Although most of these studies have either involved male participants exclusively or included too few female participants to test for moderating effects of gender (e.g., Sadeh & Verona, 2012), a small number of studies have been conducted primarily with women.

For example, consistent with previous findings for men (Levenston, Patrick, Bradley, & Lang, 2000; Patrick et al., 1993), Sutton, Vitale, and Newman (2002) found that incarcerated women with high scores on the PCL-R, particularly those scoring high on Factor 1 and low in trait anxiety, show deficient FPS (defined as augmentation of the startle reflex during unpleasant vs. neutral picture viewing) relative to women with low scores on the PCL-R. Nonetheless, psychopathic women in this study did not show significant inhibition of the startle response to unpleasant relative to neutral pictures, as has been observed in male psychopaths (Patrick et al., 1993). Verona, Bresin, and Patrick (2013) expanded on this by showing that female inmates scoring high on the PCL-R, especially Factor 1, exhibited deficient FPS more in relation to victim distress scenes (physical injury, attacks on others) than to directly threatening pictures (aimed weapons, menacing figures), highlighting a specific insensitivity to the vicarious distress of others. Two relevant picture-startle studies have been conducted involving nonincarcerated samples assessed for psychopathy using the PPI. In one study, Anderson, Stanford, Wan, and Young (2011) tested undergraduate women only and found the expected effect. In the other, which tested undergraduate participants of both genders, Justus and Finn (2007) reported decreased startle potentiation during unpleasant picture viewing in high-psychopathy men but not high-psychopathy women. Thus, findings pertaining to startle deficits in nonincarcerated women identified as high in psychopathy using the PPI are less clear than those conducted with female correctional samples.

Challenging the premise of a fundamental emotional deficit and building on their work demonstrating attentional aberrations in psychopathy, Newman and colleagues (e.g., Newman & Baskin-Sommers, 2012) have argued that psychopathic individuals should evidence abnormalities in reactivity when emotional stimuli are incidental or secondary to performance of primary task, but not otherwise. They provided support for this hypothesis in male offenders (e.g., Newman et al., 2010) and have generalized these findings to females. Specifically, Anton, Baskin-Sommers, Vitale, Curtin, and Newman (2012) found that female psychopathic offenders exhibited stronger startle responses under instructions to attend to a threatrelevant stimulus relative to when they were instructed to focus on threat-irrelevant information.

Emotional processing deficits in high-psychopathy participants have also been examined using other paradigms. Consistent with the idea that females with psychopathic traits have affectprocessing deficits similar to those evident in males, Schulreich, Pfabigan, Derntl, and Sailer (2013) found that elevated scores on the Fearless Dominance factor of the PPI-R were associated with decreased amplitude of the feedback-related negativity (FRN), a brain potential response that indexes processing of negative feedback following errors (Gehring & Willoughby, 2002). By contrast, scores on the PPI Self-Centered Impulsivity factor were unrelated to FRN amplitude, indicating that the observed processing abnormalities were specific to the affective-interpersonal features of psychopathy.

Although physiological measures of emotional processing have yielded results in females consistent with those in males, results from behavioral measures of affective processing have been equivocal. For example, in a recent study using a collegeage female sample assessed using a 29-item version of the SRP (Paulhus, Neumann, Hare, Williams, & Hemphill, 2016), Seara-Cardoso and colleagues (2013) were unable to replicate deficits in recognition of affective faces in the Emotion Multimorph task reported previously in males (e.g., Blair et al., 2004). Similarly, the finding that psychopathic males show decreased response facilitation for affective words in a lexical decision (LD) task (Lorenz & Newman, 2002; Williamson, Harpur, & Hare, 1991) did not generalize to incarcerated psychopathic females in a later study (Vitale, Mac-Coon, & Newman, 2011).

In summary, there is evidence from affectivephysiological tasks that females with psychopathic traits are characterized by abnormalities in emotional processing similar to those observed in males with psychopathic traits, with the abnormalities preferentially related to Factor 1 traits (Patrick, 1994). However, when emotional processing is assessed using behavioral paradigms (e.g., LD task, emotion multimorph task), the deficits observed in psychopathic males do not appear to replicate in females.

#### Attentional and Passive Avoidance Abnormalities

A substantial body of research with male offenders has revealed abnormalities in attentional processing and avoidance responding in high-psychopathy individuals (e.g., Newman & Baskin-Sommers, 2012). Only a few studies have tested for similar attentional and behavioral anomalies in girls or women with psychopathy and related syndromes; however, results have been relatively consistent across these studies, with females failing to show expected deficits in behavioral inhibition in particular. For example, Vitale and Newman (2001a) found that, contrary to prediction, psychopathic women did not exhibit perseverative responding on a card perseveration task that had previously differentiated male psychopathic and nonpsychopathic individuals (Newman, Patterson, & Kosson, 1987). In another study, Vitale and colleagues (2005) examined both selective attention and behavioral inhibition (or passive avoidance deficits) in a community sample of adolescents assessed for psychopathic traits using the APSD. Girls as well as boys with psychopathic traits showed attentional abnormalities (lack of interference from irrelevant peripheral cues) in a picture-word Stroop task, but only psychopathic boys showed behavioral disinhibition (increased passive avoidance errors) on a go/no-go task. Consistent with these results for community adolescents, a later study of performance on a go/no-go task conducted with incarcerated adult females found that high PCL-R scores were not associated with deficient passive avoidance, suggesting limits on the generalizability of this finding across genders (Vitale et al., 2011).

Thus, based on the few studies conducted to date, although female psychopathy appears to be associated with attentional deficits similar to those evident in high psychopathic men, there is less evidence for response perseveration or behavioral disinhibition among women with psychopathic or related traits. Further studies, and perhaps newer methodologies, are needed to resolve these differential findings involving response modulation and impulsivity in women as compared to men.

## **Conclusions and Future Directions**

There are some important conclusions to be drawn from our review of the literature on female psychopathy. The first point is that although sex biases by diagnosticians may in part account for gender differences in base rates or mean differences in psychopathy, data from diverse domains of study (including developmental, laboratory, and comorbidity research) suggest that these base rate differences also reflect distinct behavioral manifestations of antisociality in women versus men. For example, studies comparing male and female offenders have revealed salient differences in the expression of psychopathy among women, including less evidence of early behavior problems (Rutherford et al., 1998; Silverthorn & Frick, 1999), lower risk of criminal and violent recidivism (e.g., Edens et al., 2007), greater emotional dysregulation (e.g., Forouzan & Cooke, 2005; Verona et al., 2012), and higher proclivity toward sexual misbehavior or sexual risk taking (Kreis & Cooke, 2011; Rucevic, 2010).

We can also conclude, based on available findings from assessment, clinical outcome, and laboratory research with female samples, that the interpersonal-affective features of psychopathy are, for the most part, captured in a valid manner across genders by current conceptions and measures of psychopathy. For example, limited laboratory data suggest that abnormalities in emotional responding and attentional focus associated with psychopathy in males (Factor 1 features, in particular) are evident in high-psychopathy females as well. However, an exception to the evidence for similar construct validity of Factor 1 in both genders comes from research indicating that Factor 1 traits are related to some forms of emotional dysregulation and suicidality in women when accompanied by Factor 2 antisocial traits (e.g., Sprague et al., 2012), in opposition to what has been found in men. Findings along this line suggest that there may be aspects of Factor 1 that are indexed differently in women than in men, with some items (e.g., manipulation in the context of intimate relationships) serving to inflate Factor 1 scores in women more so than in men (Kreis & Cooke, 2011). More salient still, the processes underlying the impulsive-disinhibitory (Factor 2) component of psychopathy appear to differ in women compared to men, as evidenced by a lack of comparable passive avoidance deficits, and less pronounced early behavior problems and aggression in females. In women with psychopathic tendencies, Factor 2 traits may be more likely to be expressed in terms of emotional reactivity and self-directed violence rather than other-directed violence (Sadeh et al., 2011).

Taken together, although high-psychopathy men and women have similar underlying deficits in emotional and attentional processing, these deficits are either manifested differently across the genders or the measures currently available to assess impulsive-disinhibitory tendencies in the laboratory are inadequate for indexing real-life expressions of these tendencies in women. Does this mean that adjustments should be made to existing assessment instruments to better reflect the manifestation of psychopathy in women? On the one hand, studies conducted with different measures of psychopathy suggest that they show adequate reliability and validity in women, and that psychopathy scores exhibit similar associations with personality variables in men and women. To advance the field further, it will be important for researchers who use mixed-gender samples to test for gender moderation or equivalence more directly, and consistently report when differences are present or absent. Additional research on existing psychopathy instruments that includes both genders would allow the field to gather more data and reach firmer conclusions regarding gender-related differences in the properties and correlates of such assessments.

On the other hand, the PCL-R in particular does not perform as well in predicting some clinical criteria when it comes to female participants, for example, showing lower associations with violent/aggressive behavior in adult samples and conduct problems in younger female samples. There is indeed skepticism as to whether the items of the PCL-R adequately tap the characteristics that best discriminate between psychopathic and nonpsychopathic women (e.g., Kreis & Cooke, 2011; Salekin et al., 1997; Vitale & Newman, 2001b); from this perspective, assessment strategies may need to be modified for use with women. One approach may be to include other indicators of psychopathy that tap uniquely female expressions of antisocial-externalizing (Factor 2) tendencies, such as prostitution, sexual risk taking, IPV, self-directed aggression, and relational forms of aggression such as friendship betrayal and "backbiting." It is unclear whether the use of alternative indicators will further improve the validity of psychopathy assessments with women, or instead blur boundaries between psychopathy and other personality disorders in women-but such questions should be addressed through empirical studies examining associations of alternative psychopathy assessments with key external criteria. An alternative approach, recommended by Cooke, Michie, Hart, and Clark (2004), would be for research on the assessment of psychopathy in women to move away from defining the construct through reifications of popular instruments (e.g., PCL-R) and instead start from the ground up. An intermediate strategy would be to develop new, "ground-up" measures for operationalizing psychopathy and evaluate these against existing instruments, either as they are used with men, or with specific modifications made for use with women (e.g., inclusion of additional, gender-specific items).

It is not atypical for a comprehensive review of findings in a particular area to call for "further research," and this chapter is no exception. However, future research on psychopathy and gender should not take place in a theoretical vacuum. To date, insufficient emphasis has been placed on conceptually motivated work, such as testing theoretically based predictions concerning gender and mechanisms of psychopathy and its observable expressions. Systematic effort along these lines is required, as opposed to more work focused simply on generalizing findings from the male psychopathy literature to female participants. In the same vein, a gender-informed theoretical perspective can help drive research on female psychopathy toward richer interdisciplinary formulations (e.g., Javdani et al., 2011). Simply put, a call for "more research" is insufficient; what is needed is more theory development, testing, and refinement that accommodate and extend what we currently know about gender differences in biology, temperament, developmental processes, and social forces.

#### REFERENCES

- Andershed, H., Kerr, M., Stattin, H., & Levander, S. (2002). Psychopathic traits in non-referred youths: A new assessment tool. In E. Blauuw & L. Sheridan (Eds.), Psychopaths: Current international perspectives (pp. 131–158). The Hague: Elsevier.
- Anderson, N. E., Stanford, M. S., Wan, L., & Young, K. A. (2011). High psychopathic trait females exhibit reduced startle potentiation and increased P3 amplitude. *Behavioral Sciences and the Law*, 29, 649–666.
- Anton, M. E., Baskin-Sommers, A. R., Vitale, J. E., Curtin, J. J., & Newman, J. P. (2012). Differential effects

of psychopathy and antisocial personality disorder symptoms on cognitive and fear processing in female offenders. Cognitive Affective and Behavioral Neuroscience, 12, 761–776.

- Beaver, K. M., Rowland, M. W., Schwartz, J. A., & Nedelec, J. L. (2011). The genetic origins of psychopathic personality traits in adult males and females: Results from an adoption-based study. *Journal of Criminal Justice*, 39, 426–432.
- Bechara, A., Damasio, A. R., Damasio, H., & Anderson, S. W. (1994). Insensitivity to future consequences following damage to human prefrontal cortex. *Cognition*, 50, 7–15.
- Benning, S. D., Patrick, C. J., Hicks, B. M., Blonigen, D. M., & Krueger, R. F. (2003). Factor structure of the Psychopathic Personality Inventory: Validity and implications for clinical assessment. *Psychological As*sessment, 15, 340–350.
- Benton, D. (1992). Hormones and human aggression. In K. Bjorkqvist & P. Niemela (Eds.), Of mice and women: Aspects of female aggression (pp. 37–46). San Diego, CA: Academic Press.
- Berardino, S. D., Meloy, J. R., Sherman, M., & Jacobs, D. (2005). Validation of the Psychopathic Personality Inventory on a female inmate sample. *Behavioral Sciences and the Law*, 23, 819–836.
- Bjorkqvist, K., Osterman, K., & Kaukiainen, A. (1992). The development of direct and indirect aggressive strategies in males and females. In K. Bjorkqvist & P. Niemela (Eds.), Of mice and women: Aspects of female aggression (pp. 51–64). San Diego, CA: Academic Press.
- Black, D. W., Gunter, T., Allen, J., Blum, N., Arndt, S., Wenman, G., et al. (2007). Borderline personality disorder in male and female offenders newly committed to prison. *Comprehensive Psychiatry*, 48, 400–405.
- Blair, R. J. R., Mitchell, D. G. V., Peschardt, K. S., Colledge, E., Leonard, R. A., Shine, J. H., et al. (2004). Reduced sensitivity to others' fearful expressions in psychopathic individuals. *Personality and Individual Differences*, 37, 1111–1122.
- Blonigen, D. M., Hicks, B. M., Krueger, R. F., Patrick, C. J., & Iacono, W. G. (2005). Psychopathic personality traits: Heritability and genetic overlap with internalizing and externalizing psychopathology. *Psychological Medicine*, 35, 637–648.
- Bolt, D., Hare, R. D., Vitale, J. E., & Newman, J. P. (2004). A multigroup item response theory analysis of the Psychopathy Checklist—Revised. *Psychological Assessment*, 16, 155–168.
- Burnette, M. L., & Newman, D. L. (2005). The natural history of conduct disorder symptoms in female inmates: On the predictive utility of the syndrome in severely antisocial women. *American Journal of Or*thopsychiatry, 75, 421–430.
- Cadoret, R. J. (1978). Psychopathology in adopted-away offspring of biologic parents with antisocial behavior. *Archives of General Psychiatry*, 35, 176–184.

- Cale, E. M., & Lilienfeld, S. O. (2002). Histrionic personality disorder and antisocial personality disorder: Sex-differentiated manifestations of psychopathy? *Journal of Personality Disorders*, 16, 52–72.
- Capaldi, D. M., & Clark, S. (1998). Prospective family predictors of aggression toward female partners for at-risk young men. *Developmental Psychology*, 34, 1175–1188.
- Catchpole, R. E. H., & Gretton, H. M. (2003). The predictive validity of risk assessment with violent young offenders: A 1-year examination of criminal outcome. Criminal Justice and Behavior, 30, 688–708.
- Chapman, A. L., Gremore, T. M., & Farmer, R. F. (2003). Psychometric analysis of the Psychopathic Personality Inventory (PPI) with female inmates. *Journal of Personality Assessment*, 80, 164–172.
- Cleckley, H. (1976). *The mask of sanity* (5th ed.). St. Louis, MO: Mosby. (Original work published 1941)
- Cloninger, C. R., Christiansen, K. O., Reich, T., & Gottesman, I. I. (1978). Implications of sex differences in the prevalences of antisocial personality, alcoholism, and criminality for familial transmission. Archives of General Psychiatry, 35, 941–951.
- Cloninger, C. R., & Guze, S. B. (1970). Psychiatric illness and female criminality: The role of sociopathy and hysteria in the antisocial woman. *American Journal of Psychiatry*, 127, 303–311.
- Cloninger, C. R., & Guze, S. B. (1973). Psychiatric illness in the families of female criminals: A study of 288 first-degree relatives. *British Journal of Psychiatry*, 122, 697–703.
- Cloninger, C. R., Reich, T., & Guze, S. B. (1975). The multifactorial model of disease transmission: II. Sex differences in the familial transmission of sociopathy (antisocial personality). British Journal of Psychiatry, 127, 11–22.
- Cooke, D. J., & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment*, 13, 171–188.
- Cooke, D. J., Michie, C., Hart, S. D., & Clark, D. A. (2004). Reconstructing psychopathy: Clarifying the significance of antisocial and socially deviant behavior in the diagnosis of psychopathic personality disorder. *Journal of Personality Disorders*, 18, 337–357.
- Cooney, N. L., Kadden, R. M., & Litt, M. D. (1990). A comparison of methods for assessing sociopathy in male and female alcoholics. *Journal of Studies on Alcohol*, 51, 42–48.
- Crick, N. R., & Grotpeter, J. K. (1995). Relational aggression, gender, and social-psychological adjustment. Child Development, 66, 710–722.
- Czar, K. A., Dahlen, E. R., Bullock, E. E., & Nicholson, B. C. (2011). Psychopathic personality traits in relational aggression among young adults. *Aggressive Behavior*, 37, 207–214.
- Derefinko, K. J., & Lynam, D. R. (2006). Convergence and divergence among self-report psychopathy measures: A personality-based approach. *Journal of Per*sonality Disorders, 20, 261–280.

- Dolan, M. C., & Anderson, I. M. (2003). The relationship between serotonergic function and the Psychopathy Checklist: Screening Version. *Journal of Psychopharmacology*, 17, 216–222.
- Dolan, M., & Doyle, M. (2000). Violence risk prediction: Clinical and actuarial measures and the role of the Psychopathy Checklist. British Journal of Psychiatry, 177, 303–311.
- Dolan, M., & Völlm, B. (2009). Antisocial personality disorder and psychopathy in women: A literature review on the reliability and validity of assessment instruments. *International Journal of Law and Psychiatry*, 32, 2–9.
- Douglas, K. S., Lilienfeld, S. O., Skeem, J. L., Poythress, N. G., Edens, J. F., & Patrick, C. J. (2008). Relation of antisocial and psychopathic traits to suicide-related behavior among offenders. *Law and Human Behavior*, 32, 511–525.
- Edens, J. F., Campbell, J. S., & Weir, J. M. (2007). Youth psychopathy and criminal recidivism: A meta-analysis of the psychopathy checklist measures. *Law and Human Behavior*, 31, 53–75.
- Essau, C. A., Sasagawa, S., & Frick, P. J. (2006). Callous-unemotional traits in a community sample of adolescents. Assessment, 13, 454–469.
- Fazel, S., & Danesh, J. (2002). Serious mental disorder in 23,000 prisoners: A systematic review of 62 surveys. Lancet, 359, 545–550.
- Forouzan, E., & Cooke, D. J. (2005). Figuring out la femme fatale: Conceptual and assessment issues concerning psychopathy in females. *Behavioral Sciences* and the Law, 23, 765–778.
- Forth, A. E., Brown, S. L., Hart, S. D., & Hare, R. D. (1996). The assessment of psychopathy in male and female noncriminals: Reliability and validity. *Personality and Individual Differences*, 20, 531–543.
- Frick, P. J., & Hare, R. D. (2001). The Antisocial Process Screening Device. Toronto: Multi-Health Systems.
- Fulero, S. M. (1995). Review of the Hare Psychopathy Checklist—Revised. In J. C. Conoley & J. C. Impara (Eds.), *Twelfth mental measurements yearbook* (pp. 453–454). Lincoln, NE: Buros Institute.
- Gehring, W. J., & Willoughby, A. R. (2002). The medial frontal cortex and the rapid processing of monetary gains and losses. *Science*, 295, 2279–2282.
- Goldstein, R. B., Powers, S. I., McCusker, J., & Mundt, K. A. (1996). Gender differences in the manifestations of antisocial personality disorder among residential drug abuse treatment clients. *Drug and Alcohol Dependence*, 41, 35–45.
- Gough, H. G. (1969). Manual for the California Psychological Inventory. Palo Alto, CA: Consulting Psychologists Press.
- Hamburger, M. E., Lilienfeld, S. O., & Hogben, M. (1996). Psychopathy, gender, and gender roles: Implications for antisocial and histrionic personality disorders. *Journal of Personality Disorders*, 10, 41–55.
- Hare, R. D. (1978). Electrodermal and cardiovascular

correlates of psychopathy. In R. D. Hare & D. Schalling (Eds.), *Psychopathic behaviour: Approaches to research* (pp. 107–143). Chichester, UK: Wiley.

- Hare, R. D. (1980). A research scale for the assessment of psychopathy in criminal populations. *Personality* and Individual Differences, 1, 111–119.
- Hare, R. D. (1991). The Hare Psychopathy Checklist—Revised. Toronto: Multi-Heath Systems.
- Hare, R. D. (1999). Psychopathy as a risk factor for violence. Psychiatric Quarterly, 70, 191–197.
- Hare, R. D. (2003). Manual for the Hare Psychopathy Checklist—Revised (2nd ed.). Toronto: Multi-Health Systems.
- Harpur, T. J., Hare, R. D., & Hakstian, A. R. (1989). Two-factor conceptualization of psychopathy: Construct validity and assessment implications. *Psychological Assessment*, 1, 6–17.
- Hawes, D. J., Brennan, J., & Dadds, M. R. (2009). Cortisol, callous-unemotional traits, and pathways to antisocial behavior. *Current Opinion in Psychiatry*, 22, 357–362.
- Hemphala, M., & Tengstrom, A. (2010). Associations between psychopathic traits and mental disorders among adolescents with substance use problems. *British Journal of Clinical Psychology*, 49, 109–122.
- Hemphill, J., Templeman, R., Wong, S., & Hare, R. D. (1998). Psychopathy and crime: Recidivism and criminal careers. In D. J. Cooke, A. E. Forth, & R. D. Hare (Eds.), Psychopathy: Theory, research and implications for society (pp. 375–398). Boston: Kluwer.
- Hicks, B. M., Vaidyanathan, U., & Patrick, C. J. (2010). Validating female psychopathy subtypes: Differences in personality, antisocial and violent behavior, substance abuse, trauma, and mental health. *Personality Disorders: Theory, Research, and Treatment*, 1, 38–57.
- Hurley, W., & Dunne, M. (1991). Psychological distress and psychiatric morbidity in women prisoners. Australian and New Zealand Journal of Psychiatry, 25, 461–470.
- Jackson, R. L., Rogers, R., Neumann, C. S., & Lambert, P. L. (2002). Psychopathy in female offenders: An investigation of its underlying dimensions. Criminal Justice and Behavior, 29, 692–704.
- Javdani, S., Sadeh, N., & Verona, E. (2011). Suicidality as a function of impulsivity, callous–unemotional traits, and depressive symptoms in youth. *Journal of Abnormal Psychology*, 120, 400–413.
- Jordan, B. K., Schlenger, W. E., Fairbank, J. A., & Caddell, J. M. (1996). Prevalence of psychiatric disorders among incarcerated women: II. Convicted felons entering prison. Archives of General Psychiatry, 53, 513–519.
- Justus, A. N., & Finn, P. R. (2007). Startle modulation in non-incarcerated men and women with psychopathic traits. *Personality and Individual Differences*, 43, 2057–2071.
- Kennealy, P. J., Hicks, B. M., & Patrick, C. J. (2007). Validity of factors of the Psychopathy Checklist—

Revised in female prisoners: Discriminant relations with antisocial behavior, substance abuse, and personality. Assessment, 14, 323–340.

- Kim-Cohen, J., Arseneault, L., Caspi, A., Tomás, M. P., Taylor, A., & Moffitt, T. E. (2005). Validity of DSM-IV conduct disorder in 4½–5-year-old children: A longitudinal epidemiological study. *American Journal* of Psychiatry, 162, 1108–1117.
- Kimonis, E. R., Frick, P. J., Fazekas, H., & Loney, B. R. (2006). Psychopathy, aggression, and the processing of emotional stimuli in non-referred girls and boys. *Behavioral Sciences and the Law*, 24, 21–37.
- Kosson, D. S., Neumann, C. S., Forth, A. E., Salekin, R. T., Hare, R. D., Krischer, M. K., et al. (2013). Factor structure of the Hare Psychopathy Checklist: Youth Version (PCL:YV) in adolescent females. *Psychological Assessment*, 25, 71–83.
- Kreis, M. K., & Cooke, D. J. (2011). Capturing the psychopathic female: A prototypicality analysis of the Comprehensive Assessment of Psychopathic Personality (CAPP) across gender. *Behavioral Sciences and the Law*, 29, 634–648.
- Krischer, M. K., & Sevecke, K. (2008). Early traumatization and psychopathy in female and male juvenile offenders. International Journal of Law and Psychiatry, 31, 253–262.
- Krueger, R. F., Hicks, B. M., Patrick, C. J., Carlson, S. R., Iacono, W. G., & McGue, M. (2002). Etiologic connections among substance dependence, antisocial behavior and personality: Modeling the externalizing spectrum. *Journal of Abnormal Psychology*, 111, 411–424.
- Lagerspetz, K. M. J., Bjorkqvist, K., & Peltonen, T. (1988). Is indirect aggression typical of females?: Gender differences in aggressiveness in 11- to 12-yearold children. Aggressive Behavior, 14, 403–414.
- Lester, W. S., Salekin, R. T., & Sellbom, M. (2013). The SRP-II as a rich source of data on the psychopathic personality. *Psychological Assessment*, 25, 32–46.
- Levenston, G. K., Patrick, C. J., Bradley, M. M., & Lang, P. J. (2000). The psychopath as observer: Emotion and attention in picture processing. *Journal of Abnormal Psychology*, 109, 373–389.
- Lilienfeld, S. O. (1992). The association between antisocial personality and somatization disorders: A review and integration of theoretical models. *Clinical Psychology Review*, 12, 641–662.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment*, 66, 488–524.
- Lilienfeld, S. O., & Hess, T. H. (2001). Psychopathic personality traits and somatization: Sex differences in the mediating role of negative emotionality. *Journal of Psychopathology and Behavioral Assessment, 23,* 11–24.
- Logan, C., & Blackburn, R. (2009). Mental disorder in

violent women in secure settings: Potential relevance to risk for future violence. *International Journal of Law and Psychiatry*, 32, 31–38.

- Loney, B. R., Butler, M. A., Lima, E. N., Counts, C. A., & Eckel, L. A. (2006). The relation between salivary cortisol, callous–unemotional traits, and conduct problems in an adolescent non-referred sample. *Journal of Child Psychology and Psychiatry*, 47, 30–36.
- Lorenz, A. R., & Newman, J. P. (2002). Utilization of emotion cues in male and female offenders with antisocial personality disorder: Results from a lexical decision task. *Journal of Abnormal Psychology*, 111, 513–516.
- Loucks, A. D. (1995). Criminal behavior, violent behavior, and prison maladjustment in federal female offenders. Unpublished doctoral dissertation, Queen's University, Kingston, ON, Canada.
- Louth, S. M., Hare, R. D., & Linden, W. (1998). Psychopathy and alexithymia in female offenders. Canadian Journal of Behavioural Science, 30, 91–98.
- Lynam, D. R., Caspi, A., Moffitt, T. E., Loeber, R., & Stouthamer-Loeber, M. (2007). Longitudinal evidence that psychopathy scores in early adolescence predict adult psychopathy. *Journal of Abnormal Psychology*, 116, 155–165.
- Mager, K. L., Bresin, K., & Verona, E. (2014). Gender, psychopathy factors, and intimate partner violence. Personality Disorders: Theory, Research, and Treatment, 5, 257–267.
- Manuck, S. B., Flory, J. D., Ferell, R. E., Dent, K. M., Mann, J. J., & Muldoon, M. F. (1999). Aggression and anger-related traits associated with a polymorphism of the trytophan hydroxylase gene. *Biological Psychiatry*, 45, 603–614.
- Marion, B. E., & Sellbom, M. (2011). An examination of gender-moderated test bias on the Levenson Self-Report Psychopathy Scale. *Journal of Personality As*sessment, 93, 235–243.
- Marsee, M. A., Silverthorn, P., & Frick, P. J. (2005). The association of psychopathic traits with aggression and delinquency in non-referred boys and girls. Behavioral Sciences and the Law, 23, 803–817.
- Megargee, E. I. (1966). Undercontrolled and overcontrolled personality types in extreme antisocial aggression. Psychological Monographs, 80, 1–29.
- Meyer-Bahlburg, H. F., & Ehrhardt, A. A. (1982). Prenatal sex hormones and human aggression: A review, and new data on progestogen effects. Aggressive Behavior, 8, 39–62.
- Miller, J. D., Watts, A., & Jones, S. E. (2011). Does psychopathy manifest divergent relations with components of its nomological network depending on gender? *Personality and Individual Differences*, 50, 564–569.
- Moffitt, T. E. (2003). Life-course persistent and adolescence-limited antisocial behavior: A 10-year research review and research agenda. In B. B. Lahey, T. E. Moffitt, & A. Caspi (Eds.), *Causes of conduct disor-*

*der and juvenile delinquency* (pp. 49–75). New York: Guilford Press.

- Morey, L. C. (1991). An interpretive guide to the Personality Assessment Inventory (PAI). Odessa, FL: Psychological Assessment Resources.
- Newman, J. P., & Baskin-Sommers, A. R. (2012). Early selective attention abnormalities in psychopathy: Implications for self-regulation. In M. I. Posner (Ed.), *Cognitive neuroscience of attention* (2nd ed., pp. 421– 440). New York: Guilford Press.
- Newman, J. P., Curtin, J. J., Bertsch, J. D., & Baskin-Sommers, A. R. (2010). Attention moderates the fearlessness of psychopathic offenders. *Biological Psychiatry*, 67, 66–70.
- Newman, J. P., Patterson, M. C., & Kosson, D. S. (1987), Response perseveration in psychopaths. *Journal of Abnormal Psychology*, 96, 145–148.
- O'Connor, D. A. (2001). The female psychopath: Validity and factor structure of the revised Psychopathy Checklist (PCL-R) in women inmates. Unpublished doctoral dissertation, Florida State University, Tallahassee, FL.
- Odgers, C. L., Reppucci, N. D., & Moretti, M. M. (2005). Nipping psychopathy in the bud: An examination of the convergent, predictive, and theoretical utility of the PCL-YV among adolescent girls. *Behavioral Sciences and the Law*, 23, 743–763.
- Ogloff, J. R., Wong, S., & Greenwood, A. (1990). Treating criminal psychopaths in a therapeutic community program. *Behavioral Sciences and the Law, 8*, 181–190.
- O'Leary, M. M., Loney, B. R., & Eckel, L. A. (2007). Gender differences in the association between psychopathic personality traits and cortisol response to induced stress. *Psychoneuroendocrinology*, 32, 183–191.
- O'Leary, M. M., Taylor, J., & Eckel, L. (2010). Psychopathic personality traits and cortisol response to stress: the role of sex, type of stressor, and menstrual phase. *Hormones and Behavior*, 58, 250–256.
- Olweus, D., Mattsson, A., Schalling, D., & Low, H. (1988). Circulating testosterone levels and aggression in adolescent males. *Psychosomatic Medicine*, 50, 261–272.
- Pardini, D. A., Lochman, J. E., & Frick, P. J. (2003). Callous/unemotional traits and social-cognitive processes in adjudicated youths. *Journal of the American Academy of Child and Adolescent Psychiatry*, 42, 364–371.
- Patrick, C. J. (1994). Emotion and psychopathy: Startling new insights. Psychophysiology, 31, 319–330.
- Patrick, C. J., Bradley, M. M., & Lang, P. J. (1993). Emotion in the criminal psychopath: Startle reflex modulation. *Journal of Abnormal Psychology*, 102, 82–92.
- Paulhus, D. L., Neumann, C. S., Hare, R. D., Williams, K. M., & Hemphill, J. F. (2016). Manual for the Self-Report Psychopathy Scale (4th ed.). Toronto: Multi-Health Systems.
- Pechorro, P. S., Vieira, D. N., Poiares, C. A., Vieira, R.

X., Maroco, J., Neves, S., et al. (2013). Psychopathy and behavior problems: A comparison of incarcerated male and female juvenile delinquents. *International Journal of Law and Psychiatry*, 36, 18–22.

- Penney, S. R., & Moretti, M. M. (2007). The relation of psychopathy to concurrent aggression and antisocial behavior in high-risk adolescent girls and boys. *Behavioral Sciences and the Law*, 25, 21–41.
- Piotrowski, N. A., Tusel, D. J., Sees, K. L., Banys, P., & Hall, S. M. (1995). Psychopathy and antisocial personality in men and women with primary opioid dependence. Issues in Criminological and Legal Psychology, 24, 123–126.
- Poythress, N. G., Dembo, R., Wareham, J., & Greenbaum, P. E. (2006). Construct validity of the Youth Psychopathic Traits Inventory (YPI) and the Antisocial Process Screening Device (APSD) with justiceinvolved adolescents. Criminal Justice and Behavior, 33, 26–55.
- Rhee, S. H., & Waldman, I. D. (2002). Genetic and environmental influences on antisocial behavior: A meta-analysis of twin and adoption studies. *Psychological Bulletin*, 128, 490–529.
- Richards, H. J., Casey, J. O., & Lucente, S. W. (2003). Psychopathy and treatment response in incarcerated female substance abusers. *Criminal Justice and Behavior*, 30, 251–276.
- Robbins, P. C., Monahan, J., & Silver, E. (2003). Mental disorders, violence, and gender. Law and Human Behavior, 27, 561–571.
- Rogers, R., Salekin, R. T., Hill, C., Sewell, K. W., Murdock, M. E., & Neumann, C. S. (2000). The Psychopathology Checklist–Screening Version: An examination of criteria and subcriteria in three forensic samples. Assessment, 7, 1–15.
- Rogstad, J. E., & Rogers, R. (2008). Gender differences in contributions of emotion to psychopathy and antisocial personality disorder. *Clinical Psychology Review*, 28, 1472–1484.
- Roy, A., Virkkunen, M., & Linnoila, M. (1990). Serotonin in suicide, violence, and alcoholism. In E. F. Coccaro & D. L. Murphy (Eds.), Serotonin in major psychiatric disorders (pp. 185–208). Washington, DC: American Psychiatric Association.
- Rucevic, S. (2010). Psychopathic personality traits and delinquent and risky sexual behaviors in Croatian sample of non-referred boys and girls. *Law and Human Behavior*, 34, 379–391.
- Rutherford, M. J., Alterman, A. I., Cacciola, J. S., & McKay, J. R. (1998). Gender differences in the relationship of antisocial personality criteria to Psychopathy Checklist—Revised scores. *Journal of Personality Disorders*, 12, 69–76.
- Rutherford, M. J., Cacciola, J. S., Alterman, A. I., & McKay, J. R. (1996). Reliability and validity of the Revised Psychopathy Checklist in women methadone patients. Assessment, 3, 145–156.
- Sadeh, N., Javdani, S., Finy, M. S., & Verona, E. (2011). Gender differences in emotional risk for self- and

other-directed violence among externalizing adults. *Journal of Consulting and Clinical Psychology*, 79, 106–117.

- Sadeh, N., Javdani, S., Jackson, J. J., Reynolds, E. K., Potenza, M. N., Gelernter, J., et al. (2010). Serotonin transporter gene associations with psychopathic traits in youth vary as a function of socioeconomic resources. *Journal of Abnormal Psychology*, 119, 604– 609.
- Sadeh, N., Javdani, S., & Verona, E. (2013). Analysis of monoaminergic genes, childhood abuse, and dimensions of psychopathy. *Journal of Abnormal Psychology*, 122, 167–179.
- Sadeh, N., & Verona, E. (2012). Visual complexity attenuates emotional processing in psychopathy: Implications for fear-potentiated startle deficits. Cognitive Affective and Behavioral Neuroscience, 12, 346–360.
- Salekin, R. T., Rogers, R., & Sewell, K. W. (1997). Construct validity of psychopathy in a female offender sample: A multitrait–multimethod evaluation. *Journal of Abnormal Psychology*, 106, 576–585.
- Salekin, R. T., Rogers, R., Ustad, K. L., & Sewell, K. W. (1998). Psychopathy and recidivism among female inmates. *Law and Human Behavior*, 22, 109–128.
- Schmeelk, K. M., Sylvers, P., & Lilienfeld, S. O. (2008). Trait correlates of relational aggression in a nonclinical sample: DSM-IV personality disorders and psychopathy. *Journal of Personality Disorders*, 22, 269–283.
- Schrum, C. L., & Salekin, R. T. (2006). Psychopathy in adolescent female offenders: An item response theory analysis of the Psychopathy Checklist: Youth Version. Behavioral Sciences and the Law, 24, 39–63.
- Schulreich, S., Pfabigan, D. M., Derntl, B., & Sailer, U. (2013). Fearless Dominance and reduced feedbackrelated negativity amplitudes in a time-estimation task—Further neuroscientific evidence for dual-process models of psychopathy. *Biological Psychology*, 93, 352–363.
- Schultz, N., Murphy, B., & Verona, E. (2016). Gender differences in psychopathy links to drug use. Law and Human Behavior, 40, 159–168.
- Seara-Cardoso, A., Dolberg, H., Neumann, C., Roiser, J. P., & Viding, E. (2013). Empathy, morality and psychopathic traits in women. *Personality and Individual Differences*, 55, 328–333.
- Seibert, L. A., Miller, J. D., Few, L. R., Zeichner, A., & Lynam, D. R. (2011). An examination of the structure of self-report psychopathy measures and their relations with general traits and externalizing behaviors. Personality Disorders: Theory, Research, and Treatment, 2, 193–208.
- Sevecke, K., Lehmkuhl, G., & Krischer, M. K. (2009). Examining relations between psychopathology and psychopathy dimensions among adolescent female and male offenders. *European Child and Adolescent Psychiatry*, 18, 85–95.
- Silverthorn, P., & Frick, P. J. (1999). Developmental pathways to antisocial behavior: The delayed onset

pathway in girls. Development and Psychopathology, 11, 101–126.

- Skeem, J. L., Mulvey, E. P., & Grisso, T. (2003). Applicability of traditional and revised models of psychopathy to the Psychopathy Checklist: Screening Version. *Psychological Assessment*, 15, 41–55.
- Sprague, J., Javdani, S., Sadeh, N., Newman, J. P., & Verona, E. (2012). Borderline personality disorder as a female phenotypic expression of psychopathy? *Personality Disorders: Theory, Research, and Treatment*, 3, 127–139.
- Stafford, E., & Cornell, D. G. (2003). Psychopathy scores predict adolescent inpatient aggression. Assessment, 10, 102–112.
- Strand, S., & Belfrage, H. (2005). Gender differences in psychopathy in a Swedish offender sample. Behavioral Sciences and the Law, 23, 837–850.
- Sue, S. (1999). Science, ethnicity, and bias: Where have we gone wrong? American Psychologist, 54, 1070–1077.
- Sutton, S. K., Vitale, J. E., & Newman, J. P. (2002). Emotion among females with psychopathy during picture presentation. *Journal of Abnormal Psychology*, 111, 610–619.
- Taylor, G. J., Ryan, D., & Bagby, R. M. (1985). Toward the development of a new self-report alexithymia scale. Psychotherapy and Psychosomatics, 44, 191–199.
- Tellegen, A. (1982). Brief manual for the Multidimensional Personality Questionnaire. Unpublished manuscript, University of Minnesota, Minneapolis, MN.
- Teplin, L. A., Abram, K. M., & McClelland, G. M. (1996). Prevalence of psychiatric disorders among incarcerated women: I. Pretrial jail detainees. Archives of General Psychiatry, 53, 505–512.
- Tien, G., Lamb, D., Bond, L., Gillstrom, B., & Paris, F. (1993, May). Report on the needs assessment of women at the Burnaby Correctional centre for women. Burnaby, BC, Canada: BC Institute on Family Violence.
- Uzieblo, K., Verschuere, B., & Crombez, G. (2007). The Psychopathic Personality Inventory: Construct validity of the two-factor structure. *Personality and Individual Differences*, 43, 657–667.
- van Honk, J., Schutter, D. J., Hermans, E. J., Putman, P., Tuiten, A., & Koppeschaar, H. (2004). Testosterone shifts the balance between sensitivity for punishment and reward in healthy young women. *Psychoneuroendocrinology*, 29, 937–943.
- van Honk, J., Tuiten, A., Verbaten, R., van den Hout, M., Koppeschaar, H., Thijssen, J., et al. (1999). Correlations among salivary testosterone, mood, and selective attention to threat in humans. *Hormones and Behavior*, 36, 17–24.
- Verona, E., Bresin, K., & Patrick, C. J. (2013). Revisiting psychopathy in women: Cleckley/Hare conceptions and affective response. *Journal of Abnormal Psychol*ogy, 122, 1088–1093.
- Verona, E., Hicks, B. M., & Patrick, C. J. (2005). Psychopathy and suicidality in female offenders: Mediating influences of personality and abuse. *Journal of Consulting and Clinical Psychology*, 73, 1065–1073.

- Verona, E., Joiner, T. E., Johnson, F., & Bender, T. W. (2006). Gender specific gene–environment interactions on laboratory-assessed aggression. *Biological Psychology*, 71, 33–41.
- Verona, E., Patrick, C. J., & Joiner, T. T. (2001). Psychopathy, antisocial personality, and suicide attempt history risk. *Journal of Abnormal Psychology*, 110, 462–470.
- Verona, E., Sprague, J., & Javdani, S. (2012). Gender and factor-level interactions in psychopathy: Implications for self-directed violence risk and borderline personality disorder symptoms. *Personality Disorders: Theory Research and Treatment*, 3, 247–262.
- Viding, E., Frick, P. J., & Plomin, R. (2007). Aetiology of the relationship between callous–unemotional traits and conduct problems in childhood. *British Journal of Psychiatry*, 49, 33–38.
- Vitale, J. E., MacCoon, D. G., & Newman, J. P. (2011). Emotion facilitation and passive avoidance learning in psychopathic female offenders. *Criminal Justice* and Behavior, 38, 641–658.
- Vitale, J. E., & Newman, J. P. (2001a). Response perseveration in psychopathic women. *Journal of Abnor*mal Psychology, 110, 644–647.
- Vitale, J. E., & Newman, J. P. (2001b). Using the Psychopathy Checklist—Revised with female samples: Reliability, validity, and implications for clinical utility. Clinical Psychology: Science and Practice, 8, 117–132.
- Vitale, J. E., Newman, J. P., Bates, J. E., Goodnight, J., Dodge, K. A., & Pettit, G. S. (2005). Deficient behavioral inhibition and anomalous selective attention in a community sample of adolescents with psychopathic traits and low anxiety traits. *Journal of Abnormal Child Psychology*, 33, 461–470.
- Vitale, J. E., Smith, S. S., Brinkley, C. A., & Newman, J. P. (2002). The reliability and validity of the Psychopathy Checklist—Revised in a sample of female offenders. Criminal Justice and Behavior, 29, 202–231.
- Walters, G. D. (2003). Predicting institutional adjustment and recidivism with the psychopathy checklist factor scores: A meta-analysis. Law and Human Behavior, 27, 541–558.
- Walters, G. D., Gray, N. S., Jackson, R. L., Sewell, K. W., Rogers, R., Taylor, J., et al. (2007). A taxometric analysis of the Psychopathy Checklist: Screening Version (PCL:SV): Further evidence of dimensionality. Psychological Assessment, 19, 330–339.
- Warren, J. I., Burnette, M. L., South, S. C., Preeti, C., Bale, R., Friend, R., et al. (2003). Psychopathy in women: Structural modeling and comorbidity. *International Journal of Law and Psychiatry*, 26, 223–242.

Warren, J. I., & South, S. C. (2006). Comparing the

constructs of antisocial personality disorder and psychopathy in a sample of incarcerated women. *Behavioral Sciences and the Law, 24*, 1–20.

- Warren, J. I., South, S. C., Burnette, M. L., Rogers, A., Friend, R., Bale, R., et al. (2005). Understanding the risk factors for violence and criminality in women: The concurrent validity of the PCL-R and HCR-20. International Journal of Law and Psychiatry, 28, 269–289.
- Weiler, B. L., & Widom, C. S. (1996). Psychopathy and violent behavior in abused and neglected young adults. Criminal Behavior and Mental Health, 6, 253– 271.
- Weizmann-Henelius, G. (2006). Violent female perpetrators in Finland: Personality and life events. Nordic Psychology, 58, 280–297.
- Weizmann-Henelius, G., Putkonen, H., Gronroos, M., Lindberg, N., Eronen, M., & Hakkanen-Nyholm, H. (2010). Examination of psychopathy in female homicide offenders—confirmatory factor analysis of the PCL-R. International Journal of Law and Psychiatry, 33, 177–183.
- Werner, N. E., & Crick, N. R. (1999). Relational aggression and social-psychological adjustment in a college sample. *Journal of Abnormal Psychology*, 108, 615–623.
- White, H. R., & Widom, C. S. (2003). Intimate partner violence among abused and neglected children in young adulthood: The mediating effects of early aggression, antisocial personality, hostility, and alcohol problems. Aggressive Behavior, 29, 332–345.
- White, N. A., & Piquero, A. R. (2004). A preliminary empirical test of Silverthorn and Frick's delayed-onset pathway in girls using an urban, African American, US-based sample. Criminal Behaviour and Mental Health, 14, 291–309.
- Widom, C. S. (1978). An empirical classification of female offenders. Criminal Justice and Behavior, 5, 35–52.
- Williamson, S., Harpur, T. J., & Hare, R. D. (1991). Abnormal processing of affective words by psychopaths. *Psychophysiology*, 28, 260–273.
- Wilson, D. L., Frick, P. J., & Clements, C. B. (1999). Gender, somatization, and psychopathic traits in a college sample. *Journal of Psychopathology and Behavioral Assessment*, 21, 221–235.
- Yildirim, B. O., & Derksen, J. J. (2012). A review on the relationship between testosterone and the interpersonal/affective facet of psychopathy. *Psychiatry Research*, 197, 181–198.
- Zagon, I. K., & Jackson, H. J. (1994). Construct validity of a psychopathy measure. *Journal of Personality and Individual Differences*, 17, 125–135.

## CHAPTER 22

# Cultural and Ethnic Variations in Psychopathy

KOSTAS A. FANTI ALEXANDROS LORDOS ELIZABETH A. SULLIVAN DAVID S. KOSSON

ithin psychopathology research, the term "psychopathy" is used to describe a constellation of affective, interpersonal, and behavioral symptoms that coalesce to form a stable, pervasive personality disorder. A great deal of empirical research supports the construct of psychopathy as a personality disorder with widespread psychological, social, and political implications within Western society. However, because most of the research has been conducted in North America and on European American prisoners, the frequently overlooked possibility that this clinical condition may be culturally specific cannot be treated lightly. In fact, the leading tool for assessing psychopathy, the Psychopathy Checklist-Revised (PCL-R; Hare, 1991, 2003), was developed and normed almost exclusively on European Americans in prisons within Canada and the United States.

In addition to studies measuring psychopathy in prison settings, recent research on psychopathy has extended into community samples, yielding evidence that psychopathic traits can be assessed within nonincarcerated samples (e.g., Neumann, Schmitt, Carter, Embley, & Hare, 2012). Importantly, substantial research has also focused on extending the construct of psychopathy to younger ages (preschool to late adolescence), with the aim of identifying developmental pathways to persistent adult antisocial and criminal behavior. The majority of instruments for assessing psychopathy in youth are based on downward translations of adult measures, which fail to take into account possible ethnic and cultural influences that might shape the development of psychopathic traits (Verona, Sadeh, & Javdani, 2010).

Despite the limitations of existing instruments, research on psychopathy has progressed rapidly in the last 20 years, with a notable increase in efforts to measure psychopathic traits in different cultural and ethnic groups. Studies of this kind provide evidence for the reliability and validity of psychopathy scores on these instruments across cultures in community samples and incarcerated samples of youth and adults (e.g., Copestake, Gray, & Snowden, 2011; Dolan & Rennie, 2006; Fung, Gao, & Raine, 2010; Mokros et al., 2011). Several studies have also examined how psychopathy manifests across different ethnicities and the role it may play in serious criminal behavior in different cultures (e.g., Coid & Yang, 2011; Neves, Goncalves, & Palma-Oliveira, 2011; Vahl et al., 2014; Veen et al., 2011). These efforts should be encouraged as steps in the right direction to aid in increasing our knowledge of the etiology of psychopathy, and lead to a greater understanding of how cultural environments contribute to the manifestation and course of psychopathic personality.

## **Definitions and Chapter Goals**

To understand how psychopathy can manifest differently across ethnic groups and cultures, we must first define culture and ethnicity. Anthony Marsella (1987), a cross-cultural psychologist, proposed that "culture" is represented in various artifacts, architectural and expressive forms, institutions, and role and behavior patterns. Culture is also represented internally, in the values, attitudes, beliefs, cognitive styles, and patterns of consciousness of an individual. As such, it is the primary mediator or filter for interacting with the world; it is the lens through which we experience and define our reality and orient ourselves to others, the unknown, and events that impinge on us (p. 381). Through his definition, Marsella clearly demonstrates the importance of considering culture when attempting to assess and understand mental illness across cultural and ethnic groups. A subtle but important distinction in such a definition of culture is that it pertains to patterns-of ideas, values, practices, institutions, and so forth-rather than to group membership per se. Despite the fact that group membership (e.g., being the resident or national of a specific country) is not always associated with specific cultural patterns (Adams & Markus, 2004), the majority of cross-cultural psychological research has focused on comparisons between national groups. Taking ethnicity into account along with cross-national differences has the power to provide information about specific cultural groups residing within different nations. The definition of "ethnicity" (related to the Greek concept of ethnos, which refers to the people of a nation or tribe) is based in turn on the definition of culture, in that ethnicity is typically distinguished on the basis of identifiable characteristics of a group that imply a common cultural history. Of course, to the extent that members of an ethnic group differ in their degree of acculturation with the majority culture around them, there will be important individual differences within ethnic groups. Because we did not find any studies that address this issue with respect to psychopathy, we do not discuss it further in this chapter.

Current definitions of mental disorders recognize the importance of cultural and ethnic context. The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association [APA], 2013) recommends that culture and ethnicity should be taken into account in the process of clinical assessment. Specifically, DSM-5 proposes that a Cultural Formulation Interview (CFI) should be built into the diagnostic process, to systematically assess the cultural identity of the individual, cultural conceptualizations of distress, and cultural features of vulnerability and resilience, along with cultural features of the relationship between the individual and the clinician. Furthermore, DSM-5 refers to several cultural concepts of distress such as ataque de nervios ("attack of nerves"; a stress-related disorder with aggressive features, common among Latino populations) and kufungisisa ("thinking too much"; a condition of constant rumination with associated headache and dizziness, which is common among the Shona of Zimbabwe). Thus, understanding pathological behavior depends on an understanding of ethnic and cultural variety and norms. In this context, it is important to evaluate the construct of psychopathy in terms of ethnic and cultural variations, with the goal of expanding current conceptualizations of psychopathy beyond the bounds of Western society.

Our primary goal in this chapter is to evaluate what has been learned about psychopathy in terms of cultural and ethnic differences by (1) reviewing current knowledge about the base rates, mean levels, and prevalence of psychopathy; (2) examining the evidence for the universality of the construct and its factor structure; and (3) evaluating the differential expression or construct validity of psychopathic traits across cultures and ethnic groups. Throughout the chapter we consider the controversies and debates that surround psychopathy, culture, and ethnicity. Because the majority of the studies of clinical psychopathy have employed PCL measures, we emphasize the research using these measures. However, because there has been substantial relevant research using parent- and teacher-rating measures and self-report inventories, we also briefly address the empirical literatures for these measures. Because research to date has led to several distinct conceptualizations of psychopathy, our review includes research addressing several contemporary perspectives regarding the mechanisms underlying this clinical condition. These goals are addressed through consideration of studies investigating psychopathy in adult prison populations and studies conducted among community and incarcerated samples of youth.

## Anecdotal Evidence for Psychopathy across Time and Cultures

A review of the historical and cultural literature on psychopathy suggests that this clinical condition transcends both time and culture. For example, in his seminal book *The Mask of Sanity*, Cleckley described the behavior of the ancient Athenian general Alcibiades as that of a psychopath. Cleckley based his argument on many reported examples of Alcibiades' impulsive, irresponsible, and reckless behaviors. Driven primarily by self-interest and self-indulgence, these behaviors ultimately resulted in his failure as a leader (Cleckley, 1982).

Other social scientists have provided additional evidence for the existence of psychopathy across cultures. Murphy (1976) examined abnormal behaviors across a range of cultures in an attempt to evaluate the universality of various psychiatric diagnoses. Her research revealed clinical conditions similar to current conceptions of psychopathy in two nonindustrialized indigenous cultures. Within the Yorubas, a rural tribe from Nigeria, she reported on a condition known as aranakan, which describes "a person who always goes his own way regardless of others, who is uncooperative, full of malice, and bullheaded" (Murphy, 1976, p. 1026). Similarly, in the Alaskan Inuit Yupik she described the concept of the kunlangeta, which refers to a person who repeatedly lies and cheats, and is often brought to the elders for punishment (Murphy, 1976, p. 1026). Both of these conditions appear to reflect traits and behaviors consistent with contemporary Western conceptualizations of psychopathy. Even further, Murphy reported that within these two ethnic groups, people seen as having these disorders were considered incapable of change and often were dealt with through extreme measures. This belief in the intractable nature of such conditions is reminiscent of current views regarding the difficulty of treating psychopathic individuals.

Additional evidence for the presence of psychopathy across cultures can be found in the religious and literary traditions of various cultural groups. For example, in both Southern African and American literature and in many Native American religious myths, a prominent theme is that of the "trickster," who is described as one who possesses no moral or social values, inflicts great damage on those around him, and also suffers innumerable blows, defeats, indignities, and dangers resulting from his thoughtless and reckless forays (Radin, 1972). A similar archetype can be identified in ancient Greek myths pertaining to the messenger god Hermes, with whom "you'll get action, but it will be action with no moral strings attached" (Hyde, 1999). Carl Jung (1964) described the trickster as the first cycle in the hero myth, stating that the trickster is "a figure whose physical appetites dominate his behavior; he has the mentality of an infant. Lacking any purpose beyond the gratification of his primary needs, he is cruel, cynical, and unfeeling" (p. 112). The notion of the trickster as a character beyond law and morality, driven by impulses, is remarkably similar to modern concepts of the psychopath. Despite having evolved through myth and legend, the archetype of the trickster is present across many cultures. It may be argued that this transcultural concept of the trickster figure reflects a common understanding of a distinct condition that overlaps with what we currently recognize as psychopathy.

## Psychopathy in Adult Incarcerated and Psychiatric Samples

Our contemporary perspectives on the psychopathy construct have been influenced substantially by studies conducted in incarcerated and forensic or psychiatric samples. The primary clinical instruments for assessing psychopathy among adults in these settings are the PCL-R (Hare, 1991, 2003; Hare & Neumann, 2005) and its abbreviated adaptation, the Psychopathy Checklist: Screening Version (PCL:SV; Hart, Cox, & Hare, 1995). As noted earlier, these instruments were developed and normed with European American offenders in prisons within Canada and the United States. Hare (1991) has acknowledged that there may be differences in the manifestations of psychopathy across ethnic and cultural groups. In the second edition of the PCL-R manual, Hare (2003) advised that although more evidence has become available regarding the reliability and validity of PCL-R ratings across ethnic and cultural groups, caution should be exercised in interpreting scores in groups for which the PCL-R has not been validated. More recently, the interview-based Comprehensive Assessment of Psychopathic Personality (CAPP) was developed (Cooke & Logan, Chapter 9, this volume), and initial studies in Denmark (Pedersen, Kunz, Rasmussen, & Elsass, 2010) and Norway (Hoff, Rypdal, Mykletun, & Cooke, 2012; Sandvik et al., 2012) suggest that this instrument may provide a promising alternative clinical measure of psychopathy (Kreis, Cooke, Michie, Hoff, & Logan, 2012). In fact, Sandvik and colleagues (2012) found high intercorrelations between scores for the PCL-R and the CAPP in their sample of inmates at Bergen prison in Norway.

Research examining the cross-cultural validity of psychopathy represents a relatively recent phenomenon within the field of psychopathy. This new emphasis appears to reflect the increasing acceptance of psychopathy within Western society as a condition with important implications for understanding criminality and violence and for predicting recidivism (Douglas, Vincent, & Edens, Chapter 28, this volume; Hare, 1999; Salekin, Rogers, & Sewell, 1996). As North American legal and forensic communities have increasingly incorporated assessments of psychopathy into their evaluations for placement, treatment, and release, researchers and forensic professionals in other nations have begun to evaluate what role psychopathy may play in their criminal and forensic populations. The majority of the research into cross-cultural applications of psychopathy, as measured by the PCL-R, has been conducted in European nations (Cooke, 1998; Endrass, Rossegger, Urbaniok, Laubacher, & Vetter, 2008; Habermeyer, Passow, & Vohs, 2010; Pham & Saloppe, 2013). In the 2003 PCL-R manual, data from British and Swedish samples were included in a separate appendix that provided reliability data and discussion of recent studies that had evaluated the cross-cultural applicability of the PCL-R (Hare, 2003). Despite these efforts, additional studies are needed to further explore how the construct of psychopathy as assessed by the PCL-R fits with different cultural conceptualizations of mental illness and criminality.

Similarly, the possibility of differences in the manifestation of psychopathy across ethnicities has been controversial for some time. The normative data for the original PCL-R (Hare, 1991) were based largely on data for European Americans, despite the overrepresentation of African Americans in U.S. prisons. In the second edition of the PCL-R manual, Hare (2003) reviewed findings regarding relationships between psychopathy and ethnicity and concluded that although there may be differences in the way individual items function across ethnic groups, the PCL-R as a whole appears to provide a reliable and valid assessment of psychopathy in both African American and European American samples. Several researchers have addressed this issue by including race or ethnicity as a variable in their analyses. In one of the first studies to do so, Kosson, Smith, and Newman (1990) examined how the PCL functioned in samples of European American and African American prisoners. They demonstrated that psychopathy could be reliably assessed in African Americans but reported evidence of differences in the factor structure of the PCL-R and in its patterns of relations with some criterion measures across ethnic groups.

In the last 10 years, research on psychopathy using the PCL-R and its derivatives has progressed rapidly, providing evidence for the reliability and validity of PCL instruments across ethnic and cultural groups, including for the first time non-Western countries such as Brazil, Iran, and Pakistan (Jhatial, Jariko, Tahrani, & Jam, 2013; Morana, Arboleda-Florez, & Camara, 2005; Shariat et al., 2010). These studies provide additional valuable evidence regarding the PCL-R approach to assessing psychopathy. In the sections that follow, we discuss the prevalence, factor structure, and construct validity of psychopathy as indexed by various instruments across cultures and ethnicities. We review findings from studies focusing on European samples, as well as other international research efforts to assess psychopathy and evaluate the utility of the PCL-R and related measures as tools for understanding criminality. We use the terms "European American" and "African American" to refer to samples described elsewhere as "white" or "Caucasian," and "black," respectively. This difference in nomenclature reflects our emphasis on ethnic differences, not racial differences, which imply biologically based distinctions.

## The Prevalence of PCL Psychopathy across Cultures

An analysis of data from 26 samples of prisoners and psychiatric patients referred for evaluation in nine countries outside North America vielded a mean PCL-R total score of 18.7 (8.6) for 3,774 subjects (see Table 22.1). This average score is significantly lower than the overall mean of 22.0 (7.7) reported in the 2003 PCL-R manual for both prisoners and psychiatric populations, with a moderate effect size (d = 0.40) for the difference. When this pooled international sample was divided into more homogeneous samples and the means recalculated, the mean PCL-R score of 18.1 (SD = 8.4) for prisoner samples (N = 3,063) remained significantly lower than the mean for the normative North American prisoner sample listed in the manual, with a moderate effect size (d = 0.49).

Population	Cited studies	Pooled sample for total PCL-R/ PCL-R Factors	PCL-R Total	PCL-R Factor 1	PCL-R Factor 2
Portuguese	Gonçalves (1999)	150/0	15.5 (1.8)	N/A	N/A
British	Coid et al. (2009); Cooke (1995); Copestake et al. (2011); Hare (2003); Hare et al. (2000); Hobson & Shine (1998)	2003/1332	16.6 (8.1)	6.4 (3.6)	8.7 (4.5)
German	Habermayer et al. (2010); de Tribolet-Hardy et al. (2014)	93/93	20.2 (11.3)	7.9 (4.5)	10.4 (6.3)
Belgian	Pham (1998); Willemsen et al. (2011)	192/103	20.7 (9.2)	7.4 (4.4)	9.5 (5.2)
Brazilian	Flores-Mendoza et al. (2008); Morana et al. (2005)	180/180	22.2 (7.1)	9.2 (3.9)	10.5 (4.2)
Finnish	Laasajalo et al. (2011); Tikkanen et al. (2011)	239/167	22.5 (8.1)	8.8 (3.6)	12.0 (4.0)
Norwegian	Rasmussen et al. (1999)	41/21	22.6 (10.0)	9.3 (3.5)	11.0 (5.7)
Spanish	Moltó et al. (2000); Pastor et al. (2003)	165/165	23.0 (6.8)	9.8 (3.4)	10.5 (3.8)
All international J	prisoners	3,063/2,061	18.1 (8.4)	7.3 (3.9)	9.4 (4.7)
All North Americ	an prisoners	5,408/5,408	22.1 (7.9)	8.5 (3.8)	10.5 (4.3)
Finnish	Laasajalo et al. (2011)	72/0	15.4 (9.8)	N/A	N/A
German	de Tribolet-Hardy et al. (2014)	23/23	16.4 (4.5)	6.2 (2.8)	8.7 (4.0)
Belgian	Pham & Saloppé (2010)	84/84	19.6 (8.4)	7.8 (4.0)	9.6 (4.5)
Dutch	Hildebrand et al. (2002, 2004)	190/190	21.4 (8.4)	9.4 (3.8)	9.4 (4.9)
British	Blackburn et al. (2003); Blackburn & Coid (1998)	342/0	22.9 (8.7)	N/A	N/A
All international psychiatric		711/297	21.1 (8.9)	8.7 (3.9)	9.4 (4.7)
All North Americ	an psychiatric	1,246/1,246	21.5 (6.9)	8.0 (3.5)	10.9 (3.6)
All international samples		3,774/2,358	18.7 (8.6)	7.5 (3.9)	9.4 (4.7)
All North Americ	an samples	6,654/6,654	22.0 (7.7)	8.4 (3.8)	10.6 (4.2)

#### TABLE 22.1. PCL-R Psychopathy across Cultures

Note. "Prisoners" refers to general prison population; "psychiatric" refers to forensic psychiatric patients in a mental hospital or similar facility. North American comparison samples are from Hare (2003).

On the surface, this difference suggests that international prison samples tend to have lower mean PCL-R scores when compared to North American samples. However, a more careful examination reveals that the mean for international prisoner samples reflects strong overrepresentation of prisoners from Britain, where a greater number of PCL-R studies have been conducted. In fact, 2,003 of the 3,063 international participants originate from British samples, for which the mean PCL-R score is significantly lower than the mean for other countries. Focusing on scores for other individual countries, we see that mean total PCL-R scores from samples in Portugal, Britain, Germany, and Belgium are lower than for comparable U.S. samples (effect sizes of 0.16 to 1.15), whereas mean PCL-R total scores from samples in Brazil, Finland, Norway, and Spain are similar to those for U.S. samples. Pending additional norming studies, which will shed more light on this issue, it may be premature to argue that PCL-R scores are lower in international samples than in North American samples, or that the cutoff for psychopathy should arbitrarily be set at a lower score (e.g., at 25, as opposed to 30) in European samples.

We also compared PCL-R scores for the pooled international prisoner samples versus the international forensic psychiatric samples. As shown in Table 22.1, the mean PCL-R score for the international prisoner samples was significantly lower than the mean of 21.1 (8.9) for the international psychiatric samples (i.e., consisting of patients or inmates from a variety of psychiatric and secure hospitals; N = 711), a difference of close to medium effect size (d = 0.27). In contrast, the differences in means for international psychiatric samples compared to North American prisoner and psychiatric samples were quite small (d's = 0.04–0.09). In summary, moderate differences in average PCL-R scores were evident for European as compared to North American prison samples, but these differences appear to be largely attributable to British offenders. As initially reported by Sullivan and Kosson (2006), these intercontinental differences also appear to be larger for prisoner samples than for psychiatric samples.

Cooke (1998) argued that the differences in psychopathy scores between North American and international prison samples may reflect a lower prevalence of psychopathy in international samples due to cultural differences. However, an alternative possibility is that cultural differences exist in the way criminal justice systems identify and respond to mental illness across countries. For example, within the German courts, a diagnosis of psychopathic disorder can result in a verdict of diminished responsibility and institutionalization in a forensic mental hospital instead of a standard correctional facility, a disposition that would operate over time to reduce PCL-R scores in German prison samples (Felthous & Sass, 2000; Freese, Sommer, Muller-Isberner, & Ozokyay, 1999). Similarly, "psychopathic disorder" and "dangerous as a result of severe personality disorder" (DSPD) are medicolegal designations in the United Kingdom that have implications for the placement of offenders (Blackburn, Logan, Donnelly, & Renwick, 2003). The United Kingdom has special placement facilities, such as the Grendon therapeutic prison, that are designed to provide services for mentally disordered offenders detained under that nation's Mental Health Act (Doyle, Dolan, & McGovern, 2002). The Grendon facility requires a "personality disorder or psychopathy" as a prerequisite for admission (Hobson & Shine, 1998). In a study of prevalence rates, Hobson and Shine (1998) found higher base rates of psychopathy in Grendon (26%) than in traditional prisons in the United Kingdom, which they interpreted as reflecting these selection criteria. Thus, as suggested by Sullivan and Kosson (2006), differences in criminal classification policies may lead some psychopathic offenders who would be sentenced to prison in North America to instead be sent to forensic mental hospitals in other nations. This may be an important factor contributing to lower PCL-R scores in some international versus North American prisons.

This suggestion may also explain the greater similarity of the international psychiatric and forensic samples to the North American prisoner and psychiatric samples. If a greater proportion of psychopathic offenders in other nations are being placed within psychiatric facilities, then the means for international psychiatric and forensic samples should be somewhat higher and more commensurate with those for North American prisons. As an example, the impact of differential classification practices is likely reflected in the high prevalence of psychopathy (47%) in a sample of violent offenders described by Blackburn and Coid (1998). All participants in this sample had been sentenced to a special maximum security hospital after being detained under the nation's Mental Health Act and classified within the legal category of psychopathic disorder in special prison units for violent and disruptive inmates.

Because several kinds of measures for assessing psychopathic traits have been validated, it is important to consider evidence from studies using other measurement approaches. For example, Neumann and colleagues (2012) examined the prevalence of psychopathic traits as indexed by the Self-Report Psychopathy (SRP) scale in a large culturally diverse world sample (N = 33,016), consisting of individuals from the communities of 58 nations. The SRP was based on the PCL-R, and scores on the two measures are positively correlated (r = .54 in a sample of prison inmates; Hare, 1991). Neumann and colleagues provided evidence of variation in the elevation of SRP factor scores across major world regions, suggesting that cultural factors moderate the expression of the average level of SRP facet scores. Specifically, participants from the Middle East, Africa, South/ Southeast Asia, and East Asia exhibited the highest scores on the SRP's Interpersonal dimension, with participants from North America, Central/ South America, Oceania, and the northern and southern regions of Europe exhibiting lower scores on this SRP dimension. In contrast, participants from East Asia, Africa, and Northern Europe showed some of the lowest scores on the lifestyle dimension of the SRP. For the affective dimension, Western European participants exhibited the highest scores, whereas those from North America and northern and southern regions of Europe tended to have the lowest scores. Last, for the antisocial factor, participants from Western Europe, Africa, and South/Southeast Asia had the highest scores. Although these findings might not be representative of the general population, since the study was mostly based on samples of college students, this study provides evidence that crosscultural and cross-national differences influence the expression of psychopathy.

However, it is unclear whether the differences in average SRP factor scores noted by Neumann and colleagues (2012) were accompanied by differences in mean total scores, or how any such differences in total scores based on self-reports would relate to the differences in total scores noted above for the interview-based PCL-R. Consequently, studies that examine factor scores in different countries using a variety of measures of psychopathic traits will be important for determining whether these apparent cultural differences are stable across measures of psychopathy, or are specific to selfreport measures of psychopathy. In fact, several studies using the self-report-based Psychopathic Personality Inventory (PPI) have been conducted in community and offender samples in the United States (Lilienfeld & Andrews, 1996), the United Kingdom (Copestake et al., 2011), and Belgium (Maesschalck, Vertommen, & Hooghe, 2002), although data from international studies that have utilized this measure are still limited. In addition, while the cross-national differences found in the Neumann and colleagues study provide interesting avenues for further investigation, it is important to note that underlying mechanisms that might explain such differences have yet to be proposed, let alone tested empirically.

#### The Prevalence of PCL-R Psychopathy across Ethnicities

Studies examining differences in scores on the original PCL (Hare, 1980) or the PCL-R between African American and European American samples have yielded inconsistent findings, with some studies reporting higher scores in African Americans than in European Americans (Cooke, Michie, Hart, & Clark, 2005b; Kosson et al., 1990; Thornquist & Zuckerman, 1995) and others reporting no significant differences between the two (e.g., Cooke, Kosson, & Michie, 2001; Toldson, 2002). Two studies also reported higher scores in African Americans than in another (i.e., Latino) ethnic group (Sullivan, Abramowitz, Lopez, & Kosson, 2006; Thornquist & Zuckerman, 1995). In an attempt to resolve these inconsistencies, Skeem, Edens, Camp, and Colwell (2004) used meta-analytic techniques to evaluate whether levels of psychopathy differ reliably across ethnicity. These investigators compared mean PCL-R scores for African American and European American participants across 21 studies. They found a small but significant Cohen's d for PCL-R total scores (d = 0.11, SD = .23), and for scores on the Affective (d = 0.10, SD = .20) dimension of psychopathy. They also found evidence for variability in effect sizes across studies for the total score, but not for Factor 1 of the two-factor model. Given the absence of ethnicity-related differences in effect sizes for Factor 1, and the homogeneity of Factor 1 scores across ethnicities, Skeem and colleagues concluded that there is no strong evidence that African Americans have higher levels of the core psychopathic traits than European Americans, and that the difference between the two ethnic groups might be negligible. However, the heterogeneity and the variability in the range of differences in mean total PCL-R scores across ethnic groups (from +3.3 to -4.7) indicate substantial ambiguity regarding the magnitude and direction of ethnicity-related differences in psychopathy.

Lynn (2002) had earlier argued that psychopathic personality tendencies are generally higher among African Americans than European Americans. His argument was based on analyses of data for the Minnesota Multiphasic Personality Inventory (MMPI) Psychopathic Deviate scale, disruptive behavior disorder diagnoses, and a range of behavioral symptoms and statistics (school suspensions, credit ratings, crime rates, pregnancy rates, divorce rates, etc.). This work has drawn criticism for failing to distinguish psychopathy from criminality and other behaviors merely associated with psychopathy (Skeem, Edens, Sanford, & Colwell, 2003). Related to this, Lynn's (2002) failure to incorporate any research on PCL-based measures of psychopathy represents a serious limitation. Although there is substantial value in identifying links between behavioral anomalies and genetic and biological factors, it is also important to consider sociocultural mediating factors, such as poverty and socioeconomic status (SES), which may disproportionately contribute to ethnic differences in antisocial behaviors. We note that Lynn's discussion also ignores the impact of racial biases and other sociocultural factors on the higher rates of arrest and conviction, and the more severe sentences given to African Americans, factors that contribute to the overrepresentation of African Americans in prisons (Skeem et al., 2003).

## Reliability and Factor Structure of PCL-R Psychopathy across Cultures

A more systematic approach to examining crosscultural differences in psychopathy is to employ classical test theory and multivariate techniques to examine the reliability of psychopathy ratings and the dimensions that underlie them. Many attempts have been made by international investigators to validate the PCL-R as a tool for assessing psychopathy by examining the internal consistency and factor structure of scores on the measure. A number of studies using diverse samples have provided evidence for high alpha coefficients and corrected item-total correlations for the PCL-R (e.g., Cooke, 1995; Hare, 1991; Hildebrand, de Ruiter, de Vogel, & van der Wolf, 2002; Hobson & Shine, 1998; Moltó, Poy, Torrubia, 2000). Similarly, several studies have provided evidence of unidimensionality in psychopathy as assessed by clinical measures (e.g., see Cooke & Michie, 2001; Cooke et al., 2001; Harpur, Hakstian, & Hare, 1988). The acceptability of unidimensional perspectives does not contradict the possibility that relatively distinct components of psychopathy can be identified. In fact, throughout psychiatry, there is evidence that mental disorders can cluster together at higher levels, and that distinct syndromes or components can be identified at lower levels (e.g., Kim & Eaton, 2015; Patrick, Hicks, Nichol, & Krueger, 2007; Tackett et al., 2013; Wolf, Miller, & Brown, 2011; Zinbarg, Barlow, & Brown, 1997). Indeed, while indexing psychopathy as a general construct, structural analyses of the PCL-R item set have revealed correlated factors reflecting separable symptomatic aspects of psychopathy.

The factor structure of the PCL-R has been extensively investigated in North American samples, with earlier studies revealing stable two-factor models (Hare et al., 1990; Harpur et al., 1988; McDermott et al., 2000), and more recent studies pointing to three-factor (Cooke et al., 2001; Cooke & Michie, 2001), and four-factor solutions (Hare, 2003; Hare, Neumann, & Mokros, Chapter 3, this volume). The differences between these models are less dramatic than they may at first appear. As reviewed elsewhere (Cooke, Michie, & Hart, 2006; see also Hare et al., Chapter 3, this volume), across each of these solutions, a similar constellation of symptoms has emerged, including affective expression, interpersonal style, impulsive-irresponsible behavior, and, in two of three models, persistent and versatile antisocial behavior. Moreover, identical or nearly identical items load on each dimension across models.

Factor-analytic studies with European samples have also generally yielded acceptable fit for threeor four-factor solutions across samples (Cooke et al., 2005a, 2005b; Flores-Mendoza, Alvarenga, Herrero, & Abad, 2008). For example, Żukauskiene, Laurinavičius, and Čėsnienė (2010) reported good fit for the three- and four-factor models of the PCL:SV in a sample of Lithuanian offenders. Mokros and colleagues (2011) reported good fit for the four-factor PCL-R model in German offenders assessed using file information alone, but found that the antisocial factor did not appear invariant across German versus North American samples in this study. However, Mokros, Vohs, and Habermeyer (2014) reported good fit for the four-factor model in a large sample of German offenders and reported evidence of weak invariance for this structure across German and North American samples. Finally, Neumann, Johansson, and Hare (2013) reported good fit for the four-factor model of the PCL-R in a sample of Swedish prisoners, and Wilson, Abramowitz, Vasilev, Bozgunov, and Vassileva (2014) reported similar fit for the two, three, and four-factor PCL-R models in a sample of Bulgarian males at risk for substance dependence. In summary, factor analyses of data from different countries have yielded findings suggesting weak invariance for the PCL-R factor structure across cultures. These findings also point to a similar factor structure across international and North American samples (e.g., Cooke & Michie, 1999).

In addition to evidence comparing European and North American samples, Flores-Mendoza and colleagues (2008) provided evidence for a bifactor model of PCL-R ratings in a Brazilian male forensic sample, with one general factor and two specific factors somewhat similar to the original PCL-R two-factor model and to the bifactor model reported by Patrick and colleagues (2007). However, the fit was also acceptable for the threeand four-factor models in this study. In contrast, for the PCL:SV in a sample of Iranian prisoners, Shariat and colleagues (2010) reported good fit for the three-factor model but not for the four-factor model. Furthermore, Neumann and colleagues (2012) provided evidence of four factors for the SRP (Interpersonal, Affective, Lifestyle, Antisocial) using data from their large cross-national study, with structural invariance evident across different world regions.

Although these lines of research may help to clarify how culture affects the measurable expression of psychopathic traits, evidence at this time remains limited and somewhat inconsistent. We note that some of the apparent discrepancies in findings that point to three-factor versus four-factor models across cultures likely reflect the same discrepancies previously identified in North American samples, which Kosson and colleagues (2013) suggested are attributable to the use of small samples (which reduces statistical power for testing more complex models such as the fourfactor model).

## Reliability and Factor Structure of PCL-R Psychopathy across Ethnicities

As discussed earlier, Kosson and colleagues (1990) found adequate reliability for the PCL-R in an adult African American sample, as have subsequent studies (e.g., Sullivan et al., 2006; Toldson, 2002; Vitale, Smith, Brinkley, & Newman, 2002). However, Kosson and colleagues found factor structure differences between European American and African American samples: Across the two samples, the congruence coefficient for Factor 1 (the interpersonal-affective dimension) failed to meet established statistical criteria; moreover, a cross-comparison between Factor 2 (the antisocial lifestyle dimension) for the African American sample and Factor 1 from the European American sample revealed a stronger relationship than expected, suggesting poorer differentiation between factors in the African American sample. Subsequent studies have corroborated this apparent difference in factor structure. Toldson (2002), using exploratory factor analysis (EFA), failed to corroborate a two-factor model in a sample of African American federal prisoners. McDermott and colleagues (2000) also found, in a sample of African American substance abusers, that a cross-comparison between Factor 2 and Factor 1 of the PCL-R revealed a stronger relationship than was expected, suggesting poorer differentiation between factors. Thus, across studies, results from EFAs suggest that the commonly recognized dimensions of psychopathy may not manifest similarly in African American and European American samples.

An alternative to EFA for evaluating the fit of an a priori structural model is confirmatory factor analysis (CFA). Several authors have argued that CFA is more appropriate than EFA in instances where a model is available to guide research (e.g., Costello & Osborne, 2005; Van de Vijver & Leung, 1997). Studies using CFA have suggested comparable fit for the two-factor PCL-R model across African American and European American adolescent prisoner samples (Brandt, Kennedy, Patrick, & Curtin, 1997), and across African American, European American, and Puerto Rican alcoholic inpatients (Windle & Dumenci, 1999). Similarly, Cooke and colleagues (2001) found that the three-factor model demonstrated a good fit in both African American and European American inmates. Thus, in contrast to studies using EFA, results from the few CFA studies to date suggest the applicability of both the two- and three-factor PCL models across ethnic groups.

## Psychopathy in Child and Adolescent Samples

In this section, we review findings from studies that have examined cultural and ethnic differences in psychopathy in younger samples. The majority of instruments for measuring psychopathic traits in children and adolescents assess similar dimensions of psychopathy as the adult-derived PCL-R dimensions using developmentally appropriate items (Verona et al., 2010). Extending research on psychopathy to youth may help elucidate the developmental paths leading to adult psychopathy and engagement in antisocial behavior (Frick & Marsee, Chapter 19, this volume). Our review of studies focusing on participants from different cultural and ethnic backgrounds benefits greatly from evidence indicating that relationships with external variables are largely similar for adults from different countries and for adults of different ethnicities. For example, North American studies have commonly reported that psychopathy is inversely related to age of onset of criminal behavior-that is, higher PCL-R scores are associated with an earlier initiation of criminal behavior (Hemphill, Templeman, Wong, & Hare, 1998; Smith & Newman, 1990). Coid and colleagues (2009) replicated this finding in their sample of British violent offenders. Similar findings for age of onset have been obtained in Danish (Andersen, Sestoft, Lillebaek, Mortensen, & Kramp, 1999), Norwegian (Rasmussen, Storsaeter, & Levander, 1999), Portuguese (Pechorro, Barroso, Maroco, Vieira, & Gonçalves, 2015; Pechorro, Maroco, Gonçalves, Nunes, & Jesus, 2014; Pechorro, Ray, Barroso, Maroco, & Goncalves, 2016), and Spanish samples (Moltó, Poy, & Torrubia, 2000).

In addition, existing research provides evidence for the stability of psychopathic traits across different developmental periods, demonstrating that these traits are continuous over time. For example, in a long-term follow-up study with a North American sample, Lynam, Caspi, Moffitt, Loeber, and Stouthamer-Loeber (2007) found that psychopathic traits were moderately stable from early adolescence (age 13) to young adulthood (age 24; r = .32), despite the use of different informants and assessment instruments at the two age periods. Of those adolescents scoring in the top 20% on the psychopathy measure, 14% received a diagnosis of psychopathy in young adulthood (PCL:SV), suggesting that psychopathy as a whole is stable across time. Furthermore, several studies have suggested that within any given developmental stage (childhood or adolescence), the general stability of psychopathic traits tends to be high, at around 30% (e.g., Lee, Klaver, Hart, Moretti, & Douglas, 2009). Moreover, in a study in Sweden, Hemphälä, Kosson, Westerman, and Hodgins (2015) suggested that when clinical measures of psychopathy are used, the individual-level stability from adolescence to young adulthood (over a 5-year period) is relatively high. In addition to research conducted in North America, findings from studies conducted in the United Kingdom (Fontaine, Rijsdijk, McCrory, & Viding, 2010) and Cyprus (Eisenbarth, Demetriou, Kyranides, & Fanti, 2016; Fanti & Centifanti, 2014; Fanti, Colins, Andershed, & Sikki, 2017) provide further evidence for the stability of psychopathic traits across periods of childhood and adolescence; however, a subgroup of children showing decreases in these traits across time was also identified in these studies.

Although a number of studies have investigated the development of psychopathic traits during childhood and adolescence (see Frick & Marsee, Chapter 19, and Salekin, Andershed, & Clark, Chapter 20, this volume), developmental investigations of ethnic and cultural differences in psychopathy are limited. Those that do exist have used downward translations of established adult psychopathy measures (the PCL-R, in particular) to assess psychopathic traits in children and adolescents. For the most part, aside from studies using the interview-based Psychopathy Checklist: Youth Version (PCL:YV; Forth, Kosson, & Hare, 2003), studies with children and adolescents have focused on ratings by people who know the participants, or on psychopathic tendencies as assessed by selfreport questionnaires. The influence of ethnicity and culture has been examined primarily in studies using the PCL:YV and two questionnaire measures of juvenile psychopathy: (1) the Antisocial Process Screening Device (APSD) and its derivative, the Inventory of Callous-Unemotional traits (ICU), and (2) the Youth Psychopathic Traits Inventory (YPI). Our review focuses mainly on research for these measures because of their use in multiple international studies. However, other, more recently created measures are gaining support as tools for measuring psychopathy in youth across different countries-such as the Triarchic Psychopathy Measure (TriPM; Drislane, Patrick, & Arsal, 2014; Fanti, Kyranides, Drislane, Colins, & Andershed, 2016; Poy, Segarra, Esteller, López, & Moltó, 2014) and the Child Psychopathy Scale (e.g., Lynam, 1997; Verschuere, Candel, Van Reenen, & Korebrits, 2012). When data are available, we discuss cross-cultural findings from these measures.

#### Mean Levels of Youth Psychopathy

An analysis of data from four samples of youthful offenders in three countries, Portugal, the United Kingdom, and the Netherlands, yielded a lower mean PCL:YV total score than that for youthful offenders in the United States, with effect sizes ranging from 0.30 to 0.57 (see Table 22.2). Similarly, results from the one international clinical study conducted in Sweden to date indicated a lower mean PCL:YV total score for clinic-referred youth compared to those in the United States, although with a small effect size (d = 0.19). Thus, existing evidence suggests small to moderate differences between average PCL:YV scores obtained in North American versus European juvenile offenders, consistent with findings from the adult literature. However, such intercontinental differences appear to be larger for prisoner samples than for clinic-referred samples, although few studies have investigated these differences.

The mean self-report scores for callous-unemotional traits measured using the ICU in community samples of adolescents from Belgium (Roose, Bijttebier, Decoene, Claes, & Frick, 2010) and Germany (Essau, Sasagawa, & Frick, 2006) were similar to the mean for a sample of detained adolescents from the United States (Kimonis et al., 2008), but higher than the mean score for a community sample of adolescents from Cyprus (range of Cohen's d's = 0.42-0.56; Fanti & Kimonis, 2012) and lower than the mean for a sample of U. S. youth who had dropped out of high school (range of d's = 0.26–0.28; Ansel, Barry, Gillen, & Herrington, 2015). Another study using the APSD parent-report version indicated that adolescents living in Hong Kong scored higher on the Callous-Unemotional dimension, but lower on the Narcissism and Impulsivity dimensions, than North American adolescents (Fung et al., 2010).

Furthermore, community adolescents from Belgium (Roose et al., 2010) reported higher scores on the APSD dimension of callous-unemotional traits compared to either adolescent offenders from Canada (d = 0.44; Lee et al., 2009) or community children from the United States (d = 0.45; Muñoz & Frick, 2007). In contrast, APSD Narcissism scores were higher among adolescents from Cyprus (Fanti & Kimonis, 2012) compared to adolescent offenders from Canada (d = 0.25; Lee et al., 2009), community adolescents from Belgium (d = 0.40; Roose et al., 2010), or community children from the United States (d = 0.68; Muñoz & Frick, 2007). Adolescents from Canada also scored higher on the Narcissism dimension of the APSD than children from the United States (d = 0.49). However, samples from Cyprus, Canada, Belgium, and the United States did not differ on the APSD Impulsivity dimension. Because the evidence as a whole is limited, definitive conclusions cannot be drawn, and additional studies are needed to further evaluate differences in mean levels of psychopathic traits overall, as well as differences in specific components of psychopathy across cultural groups, taking into account that mean scores will vary across different types of settings (e.g., community, clinic-referred, incarcerated) in which data are collected.

In addition, a number of studies using the APSD in clinical and community settings have suggested that ethnic/minority youth, predominantly African Americans, score higher on the Callous–Unemotional, Narcissism, and Impulsivity/Conduct Problems dimensions compared

Research group	Country	Age	Population description	Sample size	PCL:YV Total
Pechorro et al. (2014)	Portugal	16.6 (1.5)	Incarcerated offenders	192	20.0 (7.2)
Dolan & Rennie (2006)	UK	16.1 (0.9)	Incarcerated offenders with conduct disorder	115	21.3 (6.6)
Das et al. (2007, 2009)	Netherlands	16.1 (1.6)	Offenders at a juvenile justice treatment institution	245	22.0 (7.2)
United States average for		24.2 (7.4)			
Andershed et al. (2007)	Sweden	16.8 (1.8)	Recipients of services at a clinic for substance misuse	64	15.4 (7.6)
United States average for clinic-referred conduct-disordered youth					

TABLE 22.2. PCL:YV Psychopathy across Cultures

to European American children and adolescents (Frick, Bodin, & Barry, 2000; Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999; Frick et al., 2003). Similarly, a study using the YPI indicated that African American males scored significantly higher than European American males on its Grandiosity and Callousness subscales (Poythress, Dembo, Wareham, & Greenbaum, 2006). These findings are in agreement with some studies in the adult literature showing that ethnic/minority participants score slightly higher on psychopathic traits. However, other studies have indicated that ethnic/minority youth score similarly to European American youth on various dimensions of the APSD and PCL:YV (Christian, Frick, Hill, Tyler, & Frazer, 1997; Poythress et al., 2006; Salekin, Leistico, Trobst, Schrum, & Lochman, 2005).

Thus, there are inconsistent findings regarding the average levels of psychopathic traits in ethnically diverse samples of youth. Verona and colleagues (2010) suggest that reported ethnic differences might actually be an artifact of SES. As with cultural differences, more studies are needed to investigate possible ethnicity-related differences. Moreover, a study conducted in the Netherlands using the YPI (Vahl et al., 2014) suggested that scores on the Lifestyle dimension of this inventory were lower among Moroccans compared to Dutch and Surinamese ethnicities. However, no differences were evident for scores on the Affective or Interpersonal dimensions of the YPI among adolescents of Dutch, Moroccan, Antillean, Turkish, and Surinamese ethnicities. Unfortunately, European studies addressing ethnicity-related differences are not available in the literature, and more studies are needed to investigate whether ethnicity effects generalize across cultures.

#### Internal Structure of Youth Psychopathy

The manual for the PCL:YV notes high internal consistency for adolescent samples of different ethnicities and cultures. The same is true for YPI, ICU, and APSD total and subscale scores (Fanti, 2013; Skeem & Cauffman, 2003), with some studies suggesting that self-report YPI scores are more internally consistent than APSD self-report scores (e.g., Poythress et al., 2006). Several factoranalytic studies of youth psychopathy have identified either three or four dimensions that appear analogous to the dimensions underlying adult psychopathy. Studies using clinical measures (e.g., the PCL:YV) and those using the SRP questionnaire have typically reported four dimensions similar to the four dimensions reported for the PCL-R (e.g., Kosson, Lorenz, & Newman, 2006; Kosson et al., 2013; Neumann et al., 2012). In contrast, studies administering the YPI and APSD questionnaires have identified three psychopathic dimensionslabeled Callous-Unemotional Traits (YPI and APSD), Narcissism (APSD) or Grandiose/Manipulation (YPI), and Impulsivity (APSD) or Impulsive/Irresponsibility (YPI) in European and North American samples (Andershed, Hodgins, & Tengström, 2007; Fanti & Kimonis, 2013; Frick et al., 2000; Vitacco, Rogers, & Neumann, 2003)-representing the affective, interpersonal, and social deviance features of psychopathy, respectively (Cooke & Michie, 2001; Frick, 2009; Frick et al., 2000; Hare, 1991). However, the correlations among corresponding dimensions of questionnaire measures such as the APSD, YPI, and Childhood Psychopathy Scale appear to be only low to moderate (Ansel et al., 2015). Similarly, correlations between factor scores for questionnaire (i.e., APSD and YPI) and clinical (PCL:YV) measures of psychopathy are only modest (Copestake et al., 2011; Kosson, 2009; Skeem & Cauffman, 2003).

The majority of studies using the YPI and APSD measures in the United States, Canada, the United Kingdom, Sweden, Netherlands, Belgium, Cyprus, Portugal, Australia, and Hong Kong corroborate the three-factor solution (see, e.g., Colins, Bijttebier, Broekaert, & Andershed, 2014; Dadds, Fraser, Frost, & Hawes, 2005; Fung et al., 2010; Pechorro, Maroco, Poiares, & Vieira, 2013; van Baardewijk et al., 2008). Recently, a very similar three-factor structure was reported for the Child Problematic Traits Inventory (CPTI) in different samples of preschool children from Italy, Belgium, the Netherlands, and Sweden (Andershed, 2014; Colins et al., 2014; Colins, Fanti, Larsson, & Andershed, 2016). In contrast, a two-factor solution, reflecting Callous-Unemotional Traits and Narcissism/Impulsivity, was more evident in studies conducted in Sweden (YPI) and Portugal (APSD) than the three-factor solution (Enebrink, Andershed, & Långström, 2005; Pechorro et al., 2013), and a study using the APSD in Russia provided evidence for an additional factor labeled Manipulativeness/Sensation Seeking (Fritz, Wiklund, Koposov, af Klinteberg, & Ruchkin, 2008). However, these studies appear to represent exceptions to the majority of studies investigating youth psychopathy. Furthermore, studies using the ICU in Belgium (Roose et al., 2010), Germany (Essau et al., 2006), the United States (Kimonis et al., 2008), and Cyprus (Fanti, Frick, & Georgiou, 2009) have identified three subfactors underlying the items of this inventory: Callousness (e.g., "the feelings of others are unimportant to me"), Unemotional (e.g., "I hide my feelings from others"), and Uncaring (e.g., "I try not to hurt others' feelings"). However, because few studies have examined the structure of the affective component of youth psychopathy, the internal structure of this component is not yet well established, and additional work is needed to establish which subdimensions best capture psychopathy in children and adolescents.

With regard to ethnicity, using a youth-adapted version of the PCL-R, Brandt and colleagues (1997) found no significant difference in scores between African American and European American male residents of a detention facility for delinquent adolescents. Using CFA, this study suggested comparable fit for the two-factor model of psychopathy across African American and European American adolescent prisoners. A study that used the YPI found a three-factor structure that was comparable across Native Dutch and Moroccan immigrant samples (Veen et al., 2011). Thus, studies conducted with adolescent participants provide preliminary, albeit limited evidence for consistency in factor structures for specific measures across different ethnic groups. In contrast with studies suggesting ethnic invariance in psychopathy factor structure, Jones, Laurens, Herba, Barker, and Viding (2009) found that the three- and four-factor PCL:YV models fit only moderately well for African American youth and showed poor fit for Latino youth in an adjudicated delinquent sample. These findings suggest that this psychopathy measure might need to be modified in order to effectively index distinct dimensions of psychopathy among minority youth.

## Construct Validity of Psychopathy across International Samples

Another important consideration in evaluating similarities versus differences in psychopathy across cultures is the construct validity of the condition as indexed by established measures in different international samples. In North American samples, replicable patterns of associations between psychopathy scores and external variables have provided a framework for conceptualizing psychopathy. If psychopathy truly transcends cultural bounds, then similar patterns of relations should be evident in international studies. Although international research on the construct validity of psychopathy is still in its early stages, the relations

between psychopathy and comorbid psychiatric diagnoses, self-report personality traits, criminal behavior, prediction of violence and recidivism, and laboratory performance have received sufficient attention to warrant discussion here. Our review of studies of adults (see Table 22.3) and youth (see Table 22.4) from different cultural and ethnic backgrounds provides evidence that the correlates of psychopathic traits are largely similar in different countries. On the whole, we note that there has been substantial research on the construct validity of adult and juvenile psychopathy in several countries in northern and western Europe (notably, Sweden, Germany, Belgium, the United Kingdom, and the Netherlands), with a rising level of research interest in the construct of juvenile psychopathy in Cyprus, Portugal, and Australia. So far, sporadic studies in other countries, such as Israel, Bulgaria, Russia, Hong Kong, Singapore, and Pakistan, while not yet adequate to provide a clear picture of the correlates of psychopathy in these specific countries, nonetheless provide initial evidence that the nomological net surrounding the psychopathy construct is similar across continents and civilizations.

#### Relations between Psychopathy and DSM Psychiatric Disorders

Studies examining relationships between psychopathy and DSM psychiatric diagnoses in international samples have demonstrated patterns very similar to those reported in North American samples. Some of the most commonly observed relationships with PCL-R psychopathy in the North American literature are for the DSM personality disorders, with antisocial personality disorder (ASPD) consistently revealing the greatest association, followed by other Cluster B disorders, and certain Cluster A diagnoses showing small to moderate associations in some studies (Hart & Hare, 1989; Warren et al., 2003; Widiger, 2005). Similarly, in studies of violent offenders in the United Kingdom, Sweden, and the Netherlands, the greatest comorbidity for individuals high in PCL-R psychopathy was with ASPD, but there was also high comorbidity with other Cluster B personality disorders (Blackburn & Coid, 1998; Hildebrand & de Ruiter, 2004; Stalenheim & von Knorring, 1996). Studies in Spain (Moltó et al., 2000), Belgium (Pham & Saloppé, 2010) and the United Kingdom (Coid et al., 2009) have also replicated the strong relationship between ASPD and PCL-R psychopathy scores.

		Psychopathy	
Study	Sample	measure	Study findings
		Swe	eden
af Klinteberg, Humble, & Schalling (1992)	199 adult males with past criminal history in adolescence	PCL 13-item version	High PCL scorers displayed high impulsivity, monotony avoidance, low socialization, high psychoticism, high anxiety, high suspicion, as well as more difficulties and more distance in their interpersonal relationships.
Stalenheim & von Knorring (1996)	61 male forensic psychiatric patients	PCL-R	Psychopathy was positively associated with substance abuse/dependence but negatively associated with depression. Almost all high PCL-R subjects had antisocial and/or borderline personality disorders.
Grann et al. (1999)	352 personality- disordered violent offenders	PCL-R	Total PCL-R scores and Factor 1 and Factor 2 scores predicted violent recidivism over a period of 2 years.
Tengstrom et al. (2000)	202 male violent offenders with schizophrenia	PCL-R	Psychopathy was strongly predictive of violent recidivism 4 years later. Other potential risk factors did not adequately explain violent recidivism.
Lang, af Klinteberg, & Alm (2002)	199 males from a socially high risk neighborhood	PCL 13-item version	Adults who had been victimized as children were more likely to develop psychopathic traits and criminal behavior.
Laurell, Belfrage, & Hellström (2010)	65 male patients at a forensic psychiatric hospital	PCL:SV	Only Factor 1 (interpersonal–affective) scores were associated with instrumentality and severity of violence.
Tikkanen et al. (2011)	176 male alcoholic offenders	PCL-R	PCL-R total scores predicted impulsive reconvictions among high-acitivity monoamine oxidase A offenders.
		Gerr	nany
Nedopil et al. (1998)	131 male offenders	PCL-R	A significant co-occurrence between psychopathy and substance dependence was found, which was stronger than the co-occurrence between psychopathy and dementia or schizophrenia.
Huchzermeier et al. (2006)	145 male offenders at the start of their sentence	PCL:SV	Prisoners high on PCL:SV were involved in more disciplinary incidents and were rated less favorably by prison staff compared to low scorers.
Habermeyer, Passow, & Vohs (2010)	26 male offenders with an order of preventive detention	PCL-R	Severely violent prisoners showed higher scores in deficient affect and in total PCL-R scores.
Eisenbarth et al. (2012)	80 female offenders	PCL-R	PCL-R total scores and antisocial and lifestyle factors predicted recidivism.
de Tribolet-Hardy et al. (2014)	90 male violent offenders	PCL-R	Factor 2 (reckless lifestyle/antisociality) scores were associated with reduced spatial intelligence and impulsivity.

## TABLE 22.3. Construct Validity of Adult Psychopathy across Cultures

(continued)

Study	Sample	Psychopathy measure	Study findings	
Belgium				
Pham, Philippot, & Rime (2000)	30 male inmates in a security prison	PCL-R	High PCL-R scorers were found to have lower blood pressure before and after emotional stimulation and subjectively reported less intense bodily sensations.	
Pham et al. (2003)	36 male inmates	PCL-R	Psychopaths displayed impaired executive functioning (specifically, a reduced ability to maintain a plan and to inhibit irrelevant information) compared to non- psychopaths.	
Pham & Saloppé (2010)	84 male forensic patients	PCL-R	Psychopathy was associated with substance use and antisocial personality disorder. Factor 1 scores were associated with Narcissism.	
Willemsen, Vanheule, & Verhaeghe (2011)	89 male prisoners	PCL-R	Interpersonal, affective, and lifestyle factor scores were inversely associated with depression scores.	
Pham & Saloppé (2013)	96 male offenders	PCL-R	Improved self-perceived quality of life in offenders with psychopathy. Arrogant/deceitful and emotional detachment facet scores were positively correlated with a favorable perception of social relations.	
		United I	Kingdom	
Blackburn & Coid (1998)	167 male violent detained offenders	PCL-R	PCL-R scores correlated highly with impulsivity, both of which were associated with violent and nonviolent criminality and substance abuse.	
Hare et al. (2000)	728 male offenders	PCL-R	PCL-R score was associated with reported prison misconduct, assaults on staff, assaults on inmates, prison property damage, and reconvictions.	
Blackburn et al. (2003)	175 male mentally disordered offenders	PCL-R	Patients with psychopathic disorders displayed high comor- bidity with anxiety, depression, bipolar disorder, obsessive– compulsive disorder, PTSD, and drug/alcohol abuse.	
Coid et al. (2009)	496 male prisoners	PCL-R	Psychopathy was correlated with younger age, repeated imprisonment, detention in higher security, disciplinary infractions, substance misuse and antisocial, narcissistic, histrionic and schizoid personality, but not neurotic disorders or schizophrenia.	
Coid & Yang (2011)	638 community males and females	PCL:SV	PCL:SV scores of 11 or above were found in 2.1% of the sample but accounted for 18.7% of violent incidents. Psychopathic traits correlated with victim injury, multiple victim subtypes, and locations.	
		The Net	herlands	
Hildebrand, de Ruiter, & Nijman (2004)	92 male forensic psychiatric patients	PCL-R	PCL-R scores were correlated with verbal abuse, verbal threat, violation of rules, total incidents and frequency of seclusion. Patients with PCL-R > 30 were more often involved in incidents, and PCL-R Factor 2 scores uniquely predicted total incidents.	

## TABLE 22.3. (continued)

Study	Sample	Psychopathy measure	Study findings		
	The Netherlands ( <i>continued</i> )				
Hildebrand & de Ruiter (2004)	98 male forensic psychiatric patients	PCL-R	High PCL-R scores were positively associated with drug and alcohol dependence, and with antisocial, paranoid, and borderline personality disorders.		
Schaap, Lammers, & De Vogel (2009)	45 female ex-patients of forensic psychiatric hospitals	PCL-R	PCL-R scores based solely on file information failed to predict violent recidivism.		
		Switze	erland		
Urbaniok et al. (2007)	96 male sex and violent offenders	PCL:SV	Psychopaths, as defined by a cutoff set at 18 points on the PCL:SV, had a 165% higher risk of violent or sexual recidivism.		
Endrass et al. (2008)	113 male sex and violent offenders	PCL-R	PCL-R total and Factor 1 scores predicted incidents of verbal but not physical aggression.		
		Dent	nark		
Andersen et al. (1999)	178 male remand prisoners	PCL-R	High PCL-R scorers were more psychosocially maladjusted, had made more previous suicide attempts, showed a younger age of criminal onset, and had higher psychoticism scores.		
Pedersen et al. (2010)	148 forensic psychiatric patients, including six females	PCL:SV, CAPP	Scores on both instruments predicted violent recidivism 5 years later.		
		Finl	and		
Laasajalo et al. (2011)	144 male homicide offenders (50% with schizophrenia)	PCL-R	Homicide offenders with schizophrenia displayed lower levels of psychopathic traits than homicide offenders without other comorbid mental health issues.		
		Nor	way		
Rasmussen, Storsaeter, & Levander (1999)	41 male prison inmates	PCL-R	Psychopaths were more likely to present with substance abuse, began their criminal careers at much younger ages, and commited more crimes compared to nonpsychopaths.		
		Spa	ain		
Moltó, Poy, & Torrubia (2000)	117 male prisoners	PCL-R	High psychopathy scores were associated with antisocial personality, hypomania, impulsivity, prison infractions, number of incarcerations, number of crimes, criminal diversity, and age of criminal onset.		

## TABLE 22.3. (continued)

(continued)

Study	Sample	Psychopathy measure	Study findings
		Spain (co	ontinued)
Pastor et al. (2003)	48 male prisoners	PCL-R	Psychopaths failed to display normal blink potentiation during the viewing of unpleasant affective images.
		Port	ugal
Neves, Gonçalves, & Palma-Oliveira (2011)	158 male non- mentally disordered offenders	PCL-R	PCL-R predicted violent and general recidivism, though the Historical, Clinical, Risk Management–20 (HCR- 20) in general outperformed it in predictive validity. The two tools displayed incremental predictive validity.
		Bulg	garia
Wilson et al. (2014)	262 community males and females	PCL:SV	Factor 2 psychopathy was associated with measures of antisocial personality, substance use, ADHD, aggression, and trait impulsivity/sensation seeking. Only pathological gambling was specifically associated with Factor 1 psychopathy.
		Bra	azil
Morana, Arboleda-Florez, & Camara (2005)	56 male inmates and 30 community controls	PCL-R	Psychopaths displayed higher sexual promiscuity, a higher proportion of aggressive behavior, higher criminal versatility, higher recdivism, and were more likely to be convicted of murder.
Flores-Mendoza et al. (2008)	124 male inmates	PCL-R	Overall PCL-R scores correlated with number of criminal offenses. No relations between PCL-R scores and personality or intelligence scores were identified.
		Paki	stan
Jhatial et al. (2013)	50 corporate executives, reporting on their managers	PCL-R	The top psychopathic characteristics ascribed to managers are grandiosity/high self-worth, failure to accept responsibility, glibness/superficial charm, cunning/manipulative, and lack of remorse or guilt.
		Singa	apore
Howard, Payamal, & Neo (1997)	50 male inmates of a medium security prison	PCL-CV	Inmates with high PCL scores displayed reduced motivation to perform in a go/no-go avoidance task.
		Aust	ralia
Watt & Brooks (2012)	327 community males and females	SRP-III	Psychopathy was associated with lower levels of empathy; higher alcohol use; proviolence thoughts; physical aggression; and elevated depression, anxiety and stress.

## TABLE 22.3. (continued)

Study	Sample	Psychopathy measure	Study findings
		United Kingd	lom
Stevens, Charman, & Blair (2001)	9 boys with psychopathic tendencies and 9 matched controls	PSD	Boys with psychopathic tendencies showed selective impairment in the recognition of sad/ fearful faces and sad vocal tone.
Blair, Budhani, Colledge, & Scott (2005)	22 boys with psychopathic tendencies and 21 matched controls	APSD	Boys with psychopathic tendencies presented with selective impairment in the recognition of fearful vocal affect.
Dolan & Rennie (2006)	115 male adolescents with conduct disorder (CD)	PCL:YV and YPI	Both instruments showed predictive validity for sub- sequent infractions. Infractions were more strongly predicted by the lifestyle/antisocial elements
Sharp, Van Goozen, & Goodyer (2006)	659 community children	APSD	Boys and girls with low affective arousal scores were more likely to score above the cutoff for psychopathy.
Dolan & Rennie (2006)	115 male adolescents with CD	YPI	The YPI identified a "psychopathic-like" CD subgroup with higher impulsive/aggressive and delinquent scores, as well as lower empathy.
Anastassiou- Hadjicharalambous & Warden (2008)	128 predominantly male children with CD	APSD	While viewing an emotionally evocative film, children with CD/callous–unemotional (CU) traits displayed smaller heart rate changes than children with CD only.
Jones et al. (2009)	17 boys with CD and CU traits, and 13 matched controls	APSD	Compared to controls, boys with CD/CU manifested lower right amygdala activity while viewing fearful faces.
Fairchild et al. (2010)	25 female adolescents with CD and 30 healthy controls	YPI	Impaired sadness recognition was observed in participants with CD and high in psychopathic traits relative to those low in psychopathic traits.
Rowe et al. (2010)	7,977 children from general population	7-item question- naire measuring CU traits	Children with CD and CU traits showed more severe behavioral disturbance and were more likely to receive a CD diagnosis 3 years later. Children high on CU traits without CD also showed evidence of disturbed functioning.
Sebastian et al. (2012)	31 boys with conduct problems and 16 typically developing subjects	ICU	While unique variance associated with conduct problems was positively correlated with amygdala reactivity, unique variance associated with CU traits was negatively correlated with amygdala reactivity.
Viding et al. (2012)	15 boys with CP/CU, 15 boys with CP only, and 16 typically developing adolescents	ICU	A greater right amygdala response to emotional faces was observed in the CD-only group when compared against the CD/CU group.
Syngelaki et al. (2013)	42 male adolescent offenders and 52 controls	YPI	Within the offender group, those with higher levels of psychopathic traits displayed reduced startle amplitudes compared to nonpsychopathic offenders.

## TABLE 22.4. Construct Validity of Youth Psychopathy across Cultures

Study	Sample	Psychopathy measure	Study findings
		The Netherla	nds
Das et al. (2009)	81 male adolescents being treated for disruptive behavior	PCL:YV	Psychopathy predicted institutional disruptive behavior and physical violence. Factor 2 scores were more strongly related to violence than Factor 1 scores. Overall, psychopathy accounted for relatively little variance in outcome criteria.
Van Baardewijk et al. (2008)	360 children from general population	YPI-CV	CU traits were negatively related to situational empathy. Scores on all psychopathy dimensions were positive correlated with symptoms of attention-deficit/hyperactivity disorder (ADHD).
Das et al. (2009)	98 male adolescents in a secure juvenile justice treatment institution	PCL:YV	PCL:YV scores were associated with scores on MMPI- A clinical scales (Alcoholism, Authority Problems, CD, Anger, Denial of Social Anxiety, Absence of Introversion, Absence of Shyness, Absence of Social Avoidance, Absence of Social Discomfort).
Manti et al. (2009)	1,748 children from general population	SEDQ	Psychopathic traits were associated with aggressive and antisocial behavior.
Roose et al. (2010)	455 male and female community adolescents	ICU	CU traits showed a significant positive association with antisocial behavior and a negative association with prosocial beliefs.
Hillege, Das, & de Ruiter (2010)	776 male and female nonreferred adolescents	YPI	Strong associations were found between psychopa- thy and hostile/dominant interpersonal style.
Feilhauer et al. (2012)	383 male children and adolescents	ICU	CU traits correlated positively with externalizing symptoms, anger, hostility, and aggression.
de Wied et al. (2012)	44 male adolescents with severe behavior problems	APSD	Disruptive adolescents high on CU traits displayed lower levels of empathic sadness than healthy controls. Heart rate and resting respiratory sinus arrhythmia (RSA) were lower in the high-CU group.
de Wied et al. (2014)	307 male and female community adolescents	APSD	High APSD scores were associated with reduced scores on the Big Five personality dimensions of Agreeableness and Conscientiousness.
		Sweden	
Langstrom & Grann (2002)	98 male violent and sex offenders, ages 15–20	PCL-R	Modest but significant associations between PCL-R scores and violent recidivism were identified.
Andershed et al. (2002)	1,279 eighth-grade community adolescents	SRP-II	Youth high on psychopathic traits scored higher than other youth on violent offenses, use of illegal drugs, and delinquent versatility.
Colins, Noom, & Vanderplasschen (2012)	768 male and female community adolescents	Belgium YPI-S	Total YPI-S scores were associated with conduct problems, hyperactivity, peer problems and all types of offenses. Scores on the affective dimension were more specifically associated with violent offenses, threats, and insults.

(continued)

Study	Sample	Psychopathy measure	Study findings
	*	Belgium (contin	nued)
Colins et al. (2014)	191 detained female adolescents	APSD and YPI	Scores on all questionnaires showed good criterion validity in terms of predicting increased offending, increased aggression and attention problems, and low Conscientiousness. Scores on the affective dimension of the YPI were also negatively correlated with Agreeableness.
		Germany	
Essau, Sasagawa, & Frick (2006)	1,443 male and female adolescents	ICU	CU traits made a unique contribution in predicting problematic behaviors. A positive association of CU traits with internalizing problems was identified, but only for girls.
		Portugal	
Pechorro et al. (2013)	760 male and female community youth, including forensic and community samples	APSD	CU traits were higher in the forensic sample than in the community sample.
Pechorro et al. (2015)	192 incarcerated male juvenile delinquents	PCL:YV	Psychopathy scores were associated with age of criminal onset, frequency of crimes, number of crimes, and use of physical violence.
Pechorro et al. (2016)	221 incarcerated male juvenile offenders	ICU	CU traits were associated with younger age of crimi- nal onset, higher number of CD symptoms, crime seriousness, use of physical violence in crimes, and alcohol, cannabis, and cocaine/heroin use.
Pechorro et al. (2014)	306 male youth in juvenile detention	APSD	Psychopathic traits were associated with age of crime onset, age at first encounter with the law, age of first incarceration, self-reported delinquency, seriousness of crime, and CD.
		Cyprus	
Fanti & Kimonis (2012)	1,416 community adolescents	APSD and ICU	Levels of bullying were highest among youth combining impulsivity, narcissism, and CU traits.
Fanti, Demetriou, & Kimonis (2013)	2,306 community adolescents	ICU	Two distinct groups of high CP/high CU adolescents were found: high anxious (with low self-esteem and markedly higher aggression) and low anxious (with higher self-esteem).
Fanti (2013)	1,674 community adolescents	ICU	Youth with high CP and CU traits scored higher on behavioral (bullying and substance use), individual (inattention, impulsivity, narcissism) and contextual (low family support) risk factors compared to CP-only youth.

(continued)

Study	Sample	Psychopathy measure	Study findings
		Cyprus (contin	ued)
Fanti et al. (2016)	73 children differentiated on CD and DSM-5 limited prosocial emotions (LPE) specifier	ICU	Among children with CD, those receiving the DSM-5 LPE specifier scored lower on startle reactivity while viewing fearful stimuli and on other behavioral and temperamental measures of fearfulness.
Fanti & Kimonis (2013)	1,416 community adolescents	APSD and ICU	Among psychopathy dimensions, narcissism best predicted which youth bullied, while impulsivity best distinguished youth susceptible to peer victimization.
Kyranides et al. (2016)	82 adolescents followed into adulthood	ICU	Among children with CD, those with CU traits scored lower on startle reactivity while viewing violent videos.
		Greece	
Manti et al. (2009)	384 children from general population	SEDQ	Psychopathic traits were associated with aggressive and antisocial behavior.
Somech & Elizur (2009)	136 adolescent boys	ICU	The association of CU traits with conduct problems was partially mediated by adolescent honor code perceptions.
		Russia	
Fritz et al. (2008)	221 male youth in juvenile detention	APSD	APSD scores, physical aggression and alcohol problems were able to discriminate between groups displaying various levels of violence.
		Hong Kong	Y -
Fung, Gao, & Raine (2010)	3,675 male and female community adolescents	APSD	APSD total scores were positively associated with aggression, delinquency, anxiety, and depression.
		Australia	
Dadds et al. (2005)	1,359 male and female preschoolers and schoolchildren	APSD	The APSD total score predicted antisocial behavior 1 year later, while the CU factor added small but significant improvements in the 1-year prediction of antisocial behavior.
Dadds et al. (2006)	98 boys from middle- class and upper-middle- class backgrounds	APSD	CU traits were uniquely associated with poor recognition of fearful faces.
Dadds et al. (2008)	100 boys from middle- class and upper-middle- class backgrounds	APSD	Psychopathic traits predicted poor fear recognition, lower number and duration of eye fixations, and fewer fixations to the eye region.

## TABLE 22.4. (continued)

However, associations for other DSM personality disorders have differed somewhat across studies. Whereas Blackburn and Coid (1998) and Hildebrand and de Ruiter (2004) reported moderate correlations for paranoid personality disorder, Stalenheim and von Knorring (1996) reported smaller (but significant) associations for this and other Cluster A personality disorder diagnoses. Similarly, although the correlation with passive-aggressive personality disorder was significant in several studies, the effect size for this relationship varied from moderate to large in samples from different countries (Blackburn & Coid, 1998; Hildebrand & de Ruiter, 2004). Finally, studies conducted in Germany and the United Kingdom found substantial comorbidity between PCL-R psychopathy and some other personality disorders (Coid et al., 2009; Nedopil, Hollweg, Hartmann, & Jaser, 1998). In particular, Coid and colleagues (2009) reported the strongest unique associations for PCL-R psychopathy with ASPD, borderline personality disorder, and histrionic personality disorder.

Substance use disorders have also been shown to covary reliably with PCL-R psychopathy in the North American literature (Ellingson et al., Chapter 26, this volume; Hart & Hare, 1989; Hemphill, Hart, & Hare, 1994; Smith & Newman, 1990). In a Norwegian prison sample, Rasmussen and colleagues (1999), Using the PCL-R, found that individuals identified as psychopathic demonstrated significantly more cannabis, inhalant, amphetamine, and opiate abuse/dependency (but not more alcohol problems) than nonpsychopathic prisoners. High comorbidities for psychopathy with substance use disorders have also been reported in Swedish offender samples (Stalenheim & von Knorring, 1996), German and Belgian forensic samples (Nedopil et al., 1998; Pham & Saloppé, 2010), Australian community adults (Watt & Brooks, 2012), youth from a juvenile justice institution in the Netherlands (Das, de Ruiter, Doreleijers, & Hillege, 2009), and U.K. special hospital patients (Blackburn et al., 2003) and prisoners (Coid et al., 2009). In studies that have reported results for PCL-R factor scores, high scores on the Impulsive-Irresponsible ("lifestyle") factor have accounted for most of the relations with substance abuse (Coid et al., 2009; Das, de Ruiter, Doreleijers, & Hillege, 2009; Watt & Brooks, 2012), paralleling findings in the North American literature (see Walsh, Allen, & Kosson, 2007, for one exception).

Relationships between PCL-R psychopathy and other DSM clinical disorder (Axis I) diagnoses

appear less consistent. The North American literature contains conflicting reports, with some studies reporting significant negative associations between PCL-R psychopathy and affective or anxiety disorders, and others reporting negligible associations (Hart & Hare, 1989; Rice & Harris, 1995). The few relevant studies outside North America appear similar, with two studies reporting negative associations between PCL-R psychopathy and depression diagnoses (Stalenheim & von Knorring, 1996; Willemsen, Vanheule, & Verhaeghe, 2011) and two other studies reporting no relationships for PCL-R psychopathy with Axis I disorders other than substance use disorders (Nedopil et al., 1998; Rasmussen et al., 1999). Furthermore, a study conducted in Australia reported that scores on the SRP, the self-report counterpart to the PCL-R, were associated positively with depression, anxiety, and stress scores (Watt & Brooks, 2012).

Further complicating findings, studies with North American child and adolescent samples have identified positive associations in some cases and negative associations in others between measures of psychopathic traits and indices of internalizing psychopathology in youth. Based on a review of North American studies along with some European studies, Sevecke and Kosson (2010) argued that the negative relationship identified in adults is much less consistent in youth samples. For example, several authors have reported positive correlations between psychopathy scores and measures of depression or anxiety (Bauer, Whitman, & Kosson, 2011; Hipwell et al., 2007; Kosson, McBride, Whitman, & Riser, 2017; Kosson, Suchy, Mayer, & Libby, 2002; Kubak & Salekin, 2009; Lynam, 1997; Price, Salekin, Klinger, & Barker, 2013; Salekin, Neumann, Leistico, DiCicco, & Duros, 2004; Schmidt, McKinnon, Chattha, & Brownlee, 2006; Vitale et al., 2005). Skeem and Cauffman (2003) provided evidence that this association might be influenced by the instrument used to measure psychopathy in youth, since ratings on the PCL:YV subfactors were unrelated to anxiety, whereas scores on the YPI subfactors were negatively related to anxiety. Recently, Frick, Ray, Thornton, and Kahn (2014) suggested that the association between callous-unemotional traits and anxiety was negative after they controlled for conduct problems; however, this was not true for the other two dimensions of psychopathy captured by the APSD. Although some have argued that the meaning of partial correlations relative to zero-order correlations in such cases is ambiguous (Lynam, Hoyle, & Newman, 2006; see also Miller & Chapman, 2001), an explanation for these inconsistent findings in terms of subject characteristics is the possibility of distinct subgroups of youth with psychopathic traits. Specifically, studies conducted in North American and European countries have provided evidence for low-anxious primary variants and high-anxious secondary variants in child, adolescent, and adult community, and incarcerated samples (Fanti, Demetriou, & Kimonis, 2013; Hicks, Markon, Patrick, Krueger, & Newman, 2004; Kimonis, Fanti, Isoma, & Donoghue, 2013; Kimonis, Frick, Cauffman, Goldweber, & Skeem, 2012). Varying representation of these subtypes in differing participant samples could account for some variations in psychopathy/anxiety associations across studies.

Finally, a "limited prosocial emotions" (LPE) specifier for conduct disorder criteria has been included in the latest, fifth edition of the DSM (APA, 2013), based on findings indicating that callous-unemotional (CU) traits demarcate a distinct subtype of conduct disorder in samples from the United States and Canada and other countries of the world, including Australia (Dadds et al., 2005), the United Kingdom (Rowe et al., 2010), Belgium (Roose et al., 2010), Germany (Essau et al., 2006), the Netherlands (Feilhauer, Cima, & Arntz, 2012), Sweden (Andershed, Gustafson, Kerr, & Stattin, 2002), Greece (Manti, Scholte, Van Berckelaer-Onnes, & Van Der Ploeg, 2009), Cyprus (Fanti & Kimonis, 2012), and Israel (Somech & Elizur, 2009). For example, available evidence (for reviews, see Frick et al., 2014; Frick & Viding, 2009) indicates that children with conduct disorder symptoms who are low on CU traits show difficulties in managing and regulating their emotions, intense emotional arousal, and oversensitivity to social threat. In contrast, children high on both conduct disorder symptoms and CU traits appear less likely to experience emotional distress, show diminished responses to punishment cues, and exhibit deficits in processing emotions of fear and sadness compared to youth with conduct problems but not CU traits. Importantly, findings along these lines for North American samples have been replicated in European samples (Fanti, Panayiotou, Lazarou, Michael, & Georgiou, 2016; Frick et al., 2014). Notably, however, groups high on CU traits and low on conduct problems (Fanti, 2013; Rowe et al., 2010), and high on CU traits along with anxiety (Fanti, Demetriou, & Kimonis, 2013), have also been identified in international studies, suggesting heterogeneity among youth with CU traits.

Items from the APSD and the ICU were used to guide the development of the DSM-5 LPE specifier, which encompasses criteria of *lack of remorse or guilt, callous/lack of empathy, unconcerned about performance,* and *shallow or deficient affect* (Frick & Moffitt, 2010). Recent studies conducted in North America and the United Kingdom, Spain, Cyprus, and other European countries provide support for the utility of this specifier in identifying distinct conduct disorder subgroups associated with different antecedents and outcomes (see Frick et al., 2014, for a review).

#### Relationships between Psychopathy and Self-Report Personality

Many international studies have also examined relations between psychopathy inventories and self-report measures of personality. In the North American literature, several studies have reported positive relationships for psychopathy as indexed by overall scores on the PCL-R with scale measures of Impulsivity, Aggression, Sensation Seeking (Hare, 2003; Verona, Patrick, & Joiner, 2001; Vitale et al., 2002), and scores on the Eysenck Personality Questionnaire (EPQ; Eysenck, 1991) Psychoticism scale (Hare, 2003; Kosson et al., 1990; see also Lilienfeld, Fowler, & Patrick, 2006; Lynam & Derefinko, 2006). However, findings are mixed concerning Extraversion, Neuroticism, Negative Emotionality, and Anxiety measures, with some studies indicating that overall PCL-R psychopathy is inversely related or unrelated to these traits (Hare, 2003; Hart, Forth, & Hare, 1991; Schmitt & Newman, 1999) and others indicating small to moderate positive relationships between total PCL-R scores and Anxiety or Negative Affectivity (Hale, Goldstein, Abramowitz, Calamari, & Kosson, 2004; Hare, 2003; Verona, Patrick, & Joiner, 2001; Vitale et al., 2002). In terms of European research, studies in Denmark (Andersen et al., 1999), Sweden (af Klinteberg, Humble, & Schalling, 1992), and the United Kingdom (Blackburn, 2007) have reported positive correlations for overall PCL-R psychopathy scores with EPQ Psychoticism. Within the Swedish study, high PCL-R psychopathy participants also showed elevations on the Neuroticism scale of the EPQ and the Impulsiveness and Monotony Avoidance scales of the Karolinska Scales of Personality (KSP; af Klinteberg et al., 1992). In a study of Spanish prisoners, Moltó and colleagues (2000) likewise reported significant correlations for PCL-R total and Factor 2 scores with the Impulsiveness scale of the KSP, as well as with the Hypomania scale of the MMPI-2 (Greene, 2000).

In assessing a U.K. sample of violent male offenders, Blackburn and Coid (1998) reported that scores on PCL-R Factor 1 were negatively related to Anxiety and Shyness but positively related to Extraversion, whereas PCL-R total and Factor 2 scores were positively related to Impulsivity scores. A study involving participants from a juvenile treatment institution in the Netherlands found that PCL:YV scores were associated with different subscales of the MMPI-Adolescent (MMPI-A; Graham, 1987), including absence of Introversion and Shyness (Das et al., 2009). These results, similar to those for North American samples (Hare, 2003), provide further evidence of the cross-cultural construct validity of PCL-R psychopathy. However, studies in both Europe (Blackburn, Logan, Renwick, & Donnelly, 2005) and South America (i.e., Brazil) found no significant associations between PCL-R psychopathy ratings and personality scale scores (Flores-Mendoza et al., 2008), indicating the need for more cross-cultural studies.

Regarding five-factor model (FFM) personality correlates, research with two samples of North American community participants showed that total scores on the Child Psychopathy Scale (based on mothers' ratings) were correlated strongly and negatively with mothers' ratings of the FFM Agreeableness and Conscientiousness dimensions as indexed by the NEO Personality Inventory-Revised (NEO-PI-R), and positively with mother's ratings of Neuroticism (Lynam et al., 2005). Likewise, studies of adolescent community samples in Germany (Essau et al., 2006) and the Netherlands (Roose et al., 2010; de Wied, van der Baan, Raaijmakers, de Ruiter, & Meeus, 2014) and detained female adolescents in Belgium (Colins, Bijttebier, et al., 2014) have reported substantial correlations for self-reported psychopathic traits as indexed by overall scores on the ICU, APSD, and YPI with self-reported FFM Agreeableness and Conscientiousness scores. Taken together, these studies provide evidence of associations for these broad personality dimensions with psychopathy total scores in child and adolescent samples, as has been shown for adult samples (Lynam, Miller, & Derefinko, Chapter 11, this volume). However, it should be noted that distinct factors or facets of psychopathy show more nuanced and in some ways contrasting relations with FFM dispositions at both the broad dimension and lower-order trait levels (Drislane et al., 2014; Patrick & Drislane, 2015; Poy et al., 2014; Verona et al., 2001).

#### Relationships between Psychopathy and Criminal Behavior

As reviewed elsewhere (see Douglas, Vincent, & Edens, Chapter 28, this volume), the majority of North American studies provide data corroborating the assumption that the criminal careers of psychopathic individuals are typically longer, more severe, and more versatile than those of low psychopathy individuals. In this section, we review research that has examined associations of psychopathic traits with extent and types of criminal offenses and institutional misconduct, comparing findings from studies of youth and adults in North America with findings for youth and adults from other countries.

Research using the PCL-R in North American samples has suggested that high-psychopathy offenders commit more violent and nonviolent crimes and have more versatile criminal careers than low-psychopathy offenders (Hare & McPherson, 1984). Relative to their Spanish prison sample, Moltó and colleagues (2000) reported that PCL-R total scores were correlated with number of incarcerations, the extent of violent and nonviolent offenses, and the number of crimes of differing types committed. Similar patterns have been observed in samples of Norwegian prisoners (Rasmussen et al., 1999), British psychiatric patients and prisoners (Blackburn & Coid, 1998; Coid et al., 2009), and Danish offenders (Andersen et al., 1999), with high PCL-R offenders consistently committing more violent and nonviolent crimes.

With respect to institutional misconduct, North American studies indicate that high PCL-R offenders commit more frequent and more severe rule infractions while detained (Brandt et al., 1997; Hare & McPherson, 1984; Heilbrun et al., 1998). This pattern was mirrored in a Dutch psychiatric sample, in which PCL-R psychopathy scores were significantly correlated with verbal abuse and threats, general violation of hospital rules, and the number of disciplinary seclusions, although not with physical violence (Hildebrand, de Ruiter, & Nijman, 2004). By contrast, Moltó and colleagues (2000) reported that in a sample of Spanish prisoners, psychopathy was correlated with both nonviolent and violent violations of prison rules. Similar findings have been reported in studies of samples of prisoners in the United Kingdom (Coid et al., 2009; Hare, Clark, Grann, & Thornton, 2000), forensic psychiatric patients in the Netherlands (Hildebrand & de Ruiter, 2004), and prisoners in Germany (Huchzermeier, Bruß, Geiger, & Godt, 2006), in which PCL-R total scores were correlated with assaults on prison staff, assaults on inmates, disciplinary infractions or incidents, frequency of seclusion, and property damage. Findings consistent with these have also been reported for youthful offenders in U.S. and U.K. juvenile facilities (Dolan & Rennie, 2006; Skeem & Cauffman, 2003). Thus, it appears that psychopathy is robustly related to multiple indices of criminal behavior across age groups and nations/cultures.

## Psychopathy and Prediction of Violence and Recidivism

North American studies have consistently found that PCL-R psychopathy scores are strongly predictive of both general and violent recidivism (Salekin et al., 1996; Serin, Peters, & Barbaree, 1990). Research has provided evidence that this relationship reflects Factor 2 features much more than Factor 1 features (Kennealy, Skeem, Walters, & Camp, 2010; Walters, 2012). Among British prisoners, Hare and colleagues (2000) found that the PCL-R was a significant predictor of general reconviction and violent reconviction over a 2-year follow-up period. Several studies of violent recidivism in Sweden have indicated that the PCL-R shows strong predictive utility for recidivism in criminal offenders with personality disorders (Grann, Langstrom, Tengstrom, & Kullgren, 1999), in criminal offenders with schizophrenia (Tengstrom, Grann, Langstrom, & Kullgren, 2000), and in alcoholic offenders (Tikkanen et al., 2011). Similarly, studies of youth in North America indicate that PCL:YV scores and indices of CU traits are predictive of violent and nonviolent recidivism (e.g., Forth et al., 2003; Schmidt et al., 2006). A meta-analysis by Edens, Campbell, and Weir (2007) suggested that PCL:YV ratings predicted both violent and nonviolent recidivism but were not predictive of sexual recidivism. Studies in the United Kingdom, Germany, and Portugal have also linked PCL-R psychopathy with repeated imprisonment and violent and nonviolent recidivism (Coid et al., 2009; Eisenbarth, Osterheider, Nedopil, & Stadtland, 2012; Neves et al., 2011). Edens and colleagues (2007) further reported that PCL instruments predict recidivism in North American and European youth samples. However, in one sample of young offenders convicted of sexual or other violent crimes, PCL-R scores were found to be a weaker predictor of violent recidivism than immigrant status, low SES, substance use diagnosis, history of psychiatric treatment, or conduct disorder before age 15 (Langstrom & Grann, 2002).

Taken together, these studies suggest that psychopathy is generally a strong predictor of violence and overall recidivism in North American and international adult samples; additional investigation is required to confirm whether psychopathy is also a useful predictor of recidivism amongst juvenile offenders.

## Psychopathy and Psychophysiological and Behavioral Correlates

Experimental studies of cognitive and emotional processing in North American samples of psychopathic individuals have provided evidence that psychopathy is associated in particular with deficits in emotional processing. Several specific kinds of emotional processing deficits have been reported. Notably, PCL-R psychopathy has been associated with deficient performance in affect recognition tasks (e.g., Blair et al., 2002; Kosson et al., 2002) and with reduced responsiveness to emotional information in lexical decision and recall tasks (e.g., Lorenz & Newman, 2002a; Williamson, Harpur, & Hare, 1991). Several studies have also provided evidence for similar emotional processing deficits in adolescents with psychopathic features. Notably, studies of North American youth samples have provided evidence for reduced impact of affective information in implicit and explicit processing of facial affect (e.g., Marsh et al., 2008) and in the context of affective lexical decision making (Loney, Frick, Clements, Ellis, & Kerlin, 2003). Findings from studies of youth samples in Britain have replicated performance impairments in affect recognition, extending the findings to vocal affect recognition (Blair, Budhani, Colledge, & Scott, 2005; Blair, Colledge, Murray, & Mitchell, 2001; Muñoz, 2009; Stevens, Charman, & Blair, 2001). Children and adolescents with psychopathic traits have also shown specific deficits in responding to and understanding fearful and sad facial expressions in studies conducted in Australia (Dadds, El Masry, Wimalaweera, & Guastella, 2008; Dadds et al., 2006). These findings agree with a meta-analysis of studies examining deficits in facial-affect recognition among antisocial populations (Marsh & Blair, 2008), although more recent meta-analyses suggest that the affect recognition deficits are not significantly greater for fearful faces than for certain other emotions, indicating that methodological factors may have impacted the results from prior studies of affect recognition in adults and youth (Dawel, O'Kearney, McKone, & Palermo, 2012; Wilson, Juodis, & Porter, 2011).

Findings obtained with the "countdown" paradigm (Hare, 1978), which assesses physiological activity during the anticipation of a forthcoming noxious event, have also indicated relationships between psychopathic traits and physiological responsiveness prior to the occurrence of predictable aversive stimuli. Consistent with prior work in adults (Hare, 1978; Ogloff & Wong, 1990), findings in samples of North American youth have yielded evidence for reduced electrodermal responsiveness but normal or enhanced cardiac responsiveness in anticipation of shocks or loud noises (Fung et al., 2005; Hare, 1978; Wang, Baker, Gao, Raine, & Lozano, 2012).

Although there are no published studies using the countdown paradigm outside of North America, researchers studying physiological responding in other contexts conducted in the United Kingdom (Anastassiou-Hadjicharalambous & Warden, 2008) and the Netherlands (de Wied, van Boxtel, Matthys, & Meeus, 2012) have reported related findings. Notably, among children high in conduct problems, those with elevated CU traits exhibit psychophysiological anomalies at rest (low heart rate in one study, reduced parasympathetic activity in another) and reduced heart rate reactivity in response to emotionally evocative films designed to induce fear and sadness (Anastassiou-Hadjicharalambous & Warden, 2008; de Wied et al., 2012; Fanti & Kimonis, 2017).

Although, at first glance, these patterns appear consistent with dominant theories regarding emotional deficits associated with psychopathy, closer inspection reveals difficulties in interpreting these findings. Notably, there is relatively consistent evidence linking low resting heart rate to antisocial behavior and parasympathetic disturbances to several forms of psychopathology (de Wied et al., 2012), but many studies of psychopathy other than those cited earlier have not found significant differences in resting heart rate or parasympathetic function (e.g., see reviews by Hare, 1978; Raine, 1997). In addition, the few published North American studies examining responsiveness to emotional films in adults with psychopathic traits generally suggest no differences in autonomic reactivity or facial responsiveness to most stimuli of this type (Forth, 1992; Patterson, 1991), a result also obtained in a Belgian study of psychopathic and nonpsychopathic offenders (Pham, Philippot, & Rime, 2000). Interestingly, Patrick, Cuthbert, and Lang (1994) reported that reduced heart rate response during imagery of fearful situations was associated more with higher Factor 2 scores than with the full constellation of psychopathic traits, suggesting that deficient reactivity within this processing context may reflect antisociality rather than psychopathy.

Another physiological anomaly that has been replicated in multiple samples is the association between psychopathy and a specific deficit in defensive activation to aversive stimuli, as evidenced by a lack of startle potentiation during viewing of negatively valent pictures (Levenston, Patrick, Bradley, & Lang, 2000; Patrick, Bradley, & Lang, 1993; Patrick et al., 1994). This work has been replicated in European studies of adults with psychopathic traits. For example, in a study of Spanish prisoners, Pastor, Moltó, Vila, and Lang (2003) reported that high PCL-R scorers displayed diminished startle response while viewing negative affective pictures compared with low PCL-R scorers.

However, studies of affect-startle modulation in adolescent samples have yielded inconsistent findings (see Fanti, 2016, for a review). In the United Kingdom, Fairchild, Stobbe, Van Goozen, Calder, and Goodyer (2010) reported no differences between females with or without psychopathic traits, as assessed by the YPI in startle modulation during viewing of facial emotions of differing valence. However, Syngelaki, Fairchild, Moore, Savage, and van Goozen (2013) found that U.K. juvenile high-psychopathy offenders, as assessed by the YPI, showed lower startle magnitude overall during viewing of neutral, positive, and negative stimuli compared to low-psychopathy offenders, suggesting a general deficit in startle reactivity. Taking into account the DSM-5 LPE specifier (reflecting the presence of CU traits), a recent study in Cyprus (Fanti, Panaviotou, et al., 2016) has extended the robust finding of deficient aversive startle potentiation in adults with psychopathic traits to younger participants. Consistent with findings for adult samples (Patrick, 1994; Vaidyanathan, Hall, Patrick, & Bernat, 2011), results from this study of youth indicated that deficient startle potentiation was associated specifically with the affective features of psychopathy, indexed in this case by CU traits. These findings have been replicated in an additional study in Cyprus that followed participants at differential risk for conduct disorder and CU traits from adolescence to adulthood (Kyranides, Fanti, & Panayiotou, 2016).

Importantly, increased startle reactivity during aversive cueing provides a direct index of amygdala

activation, which has been empirically linked to defensive (fear) reactivity. Thus, the lack of aversive startle potentiation in adults high in the affective-interpersonal dimension of psychopathy suggests a lack of normal defensive activation in response to negative emotional cues (Blair, 2013; Frick et al., 2014; Patrick, 1994). Consistent with the idea of a deficit in the brain's core defensive system, functional neuroimaging studies conducted in both the United Kingdom and United States provide evidence that children and adolescents high in CU traits along with conduct problems exhibit lower amygdala reactivity to fearful faces, or other negatively valent stimuli, than do normal controls (Jones et al., 2009; Marsh et al., 2008; Sebastian et al., 2012; Viding et al., 2012; White et al., 2012).

Psychopathy has also been associated with deficits in response modulation, as assessed by behavior in reward-punishment tasks (Hamilton & Newman, Chapter 4, this volume) and performance on executive functioning tasks (LaPierre, Braun, & Hodgins, 1995; Newman, Patterson, & Kosson, 1987). In a study of Belgian prisoners, Pham, Vanderstukken, Philippot, and Vanderlinden (2003) found a pattern of performance consistent with impaired behavioral inhibition in adults. In one of the few studies of youth with psychopathic traits, Roussy and Toupin (2000) reported similar behavioral deficits in French-speaking Canadian youth. Similarly, consistent with earlier reports from work with adult offenders (Newman et al., 1987), Barry and colleagues (2000) reported that youth exhibiting CU traits in conjunction with conduct problems displayed response perseveration on an approach motivation task relative to low-CU youth with conduct problems. Furthermore, Whitman, Kosson, and McBride (2012) reported that psychopathic traits were associated with poorer passive avoidance learning in a paradigm based loosely on that used in adult studies by Newman and Kosson (1986). Although one prior study had failed to detect an association between psychopathic traits in youth and an excess of commission errors during passive avoidance learning (Scerbo et al., 1990), the null result in this study may reflect the use of measures that focused disproportionately on the impulsive, irresponsible, lifestyle components of psychopathy.

In summary, the few experimental studies conducted in international samples suggest that some cognitive- and emotional-processing deficits in psychopaths generalize across nations and cultures. However, the small number of studies and observed inconsistencies in their findings emphasize the need for caution when drawing conclusions about the cross-cultural generality of mechanisms underlying psychopathy.

# Construct Validity of Psychopathy across Ethnicities

As noted previously, delineating systematic relationships of measures of psychopathy with external criterion variables is central to understanding this clinical condition. If psychopathy exists in a coherent, consistent manner across differing nations and people, its correlates should be similar across ethnic groups. Unfortunately, much of the extant research on the construct validity of psychopathy has utilized ethnically diverse samples, without explicitly examining ethnicity or race as a potential moderating variable. Among the few studies that have explicitly addressed this issue, analytic methods have varied substantially, from correlational and regression analyses to testing of main effects in analysis of variance models. In this section, we review findings from studies that have directly examined effects of ethnicity on relationships between psychopathy and self-report measures of personality, criminal behavior indices, and experimental paradigms assessing cognitive and emotional processing.

We noted earlier that relationships between self-report personality measures and psychopathy have been somewhat inconsistent, even in European Americans. To shed light on potential ethnic differences, Kosson and colleagues (1990) compared correlations between PCL-R psychopathy scores and various self-report criterion measuresin African American versus European American male prisoners. Although most relationships were similar across ethnic groups, psychopathy was related to Extraversion in African Americans but not in European Americans. Conversely, psychopathy was positively correlated with Psychoticism, Impulsiveness, and Monotony Avoidance in European Americans but not in African Americans—a finding that may imply differences in the relationship between impulsivity and psychopathy in African American prisoners. Thornquist and Zuckerman (1995) found a similar pattern, with a significant correlation between PCL Psychopathy and Impulsiveness/Sensation Seeking in a European American sample that did not replicate in African American and Latino participants. Similar findings were reported from a study that com-
pared European American to African American civil psychiatric patients (Jackson, Neumann, & Vitacco, 2007).

Vitale and colleagues (2002) compared relationships for PCL-R scores with personality variables in a female prisoner sample. Similar to Kosson and colleagues (1990), they found a positive relationship between psychopathy and EPQ Psychoticism in European Americans that did not replicate in African American participants. However, in contrast to Kosson and colleagues, they found negative correlations of comparable magnitude between PCL-R total scores and scores on the Constraint factor of the Multidimensional Personality Questionnaire in the two ethnic groups. They also found similar associations across African American and European American subsamples for the other personality variables, including comparable positive correlations between Negative Affectivity and PCL-R Factor 2 scores. By contrast, Sullivan and colleagues (2006) reported positive correlations between Trait Anxiety and Impulsive-Antisocial (Factor 2) features of psychopathy in African American but not European American prisoners-although associations with other criterion measures were largely similar for these ethnic subgroups. Thus, current findings as a whole suggest that relationships between PCL-R psychopathy scores and personality variables are generally similar across African American and European American participants, but some inconsistencies in findings for Impulsivity, Psychoticism, and Negative Affectivity highlight the need for additional studies.

Other researchers have tested for ethnic differences in relationships between PCL-R psychopathy and indices of criminal behavior. Kosson and colleagues (1990) reported no Psychopathy × Ethnicity interaction for either number or versatility of criminal charges. Vitale and colleagues (2002) found similar associations for number and type of criminal charges across female African American and European American prisoners. In a study of subgroups of male prisoners differing in ethnicity but matched on age, IQ, and years of education, Sullivan and colleagues (2006) found generally parallel patterns of correlations between psychopathy and the number of violent and nonviolent charges across African American, European American, and Latino inmates. In all cases, partial correlations were substantially smaller than zeroorder correlations, demonstrating the importance of shared variance among the components of psychopathy in relationships between psychopathic traits and violent and nonviolent criminality. Although there were no significant interactions involving antisocial behavior criteria, Sullivan and colleagues reported some ethnicity-specific relationships between psychopathy facets and criminal charges for violent and nonviolent offenses, and raised the possibility that psychopathy–ethnicity interactions for some of these variables might have achieved significance in larger samples.

To date, only two studies have addressed the role of PCL-R psychopathy as a predictor of criminal behavior across ethnic groups. Walsh and Kosson (2007) reported that PCL-R scores prospectively predicted both total and violent arrests over a 3-year follow-up period. However, when the effects of SES were considered, differing associations were found for African versus European American participants: Whereas PCL-R psychopathy was predictive of recidivism among African Americans regardless of SES, a significant Psychopathy  $\times$  SES interaction was evident for European American participants, indicating that PCL-R scores predicted recidivism only among low-SES European Americans. However, because this was the first study to have addressed interactive relationships between psychopathy and SES, caution is warranted. In another study, Walsh (2013) reported greater predictive validity for PCL-R psychopathy among European American than among African American offenders, but also found that psychopathy scores did not predict violent recidivism among Latino American offenders. Clearly, additional investigations examining interactive effects of psychopathy with SES and ethnicity are needed. Nevertheless, studies conducted to date provide evidence for the construct validity of PCL-R psychopathy in African American and Latino, as well as European American samples, while suggesting the possibility that some relationships between psychopathy and antisocial behavior reported for European American psychopaths may not generalize to other ethnic groups and may be influenced by different moderating variables.

In addition, a number of researchers have examined criminal recidivism and violence in samples of adjudicated youth of differing ethnicities. The meta-analysis by Edens and colleagues (2007) indicated that psychopathy, as assessed by PCL instruments, was a weaker predictor of violent recidivism among minority than among nonminority youth, but ethnicity did not moderate the prediction of general recidivism. However, more recent studies have yielded inconsistent findings regarding the effect of ethnicity on the association between psychopathic traits and recidivism. Among an ethnically heterogeneous sample of 75 adolescents, including Latino along with African and European American adolescents, Edens and Cahill (2007) reported that PCL:YV ratings were unrelated to recidivism over a 10-year follow-up interval, and that ethnicity was not a significant moderator of the association between psychopathy and recidivism. In contrast, Schmidt and colleagues (2006) reported that PCL:YV ratings were robustly predictive of recidivism over a 3-year follow-up interval among both Native Canadian youth and among youth of European descent living in Canada, but in this sample, psychopathy ratings were more strongly related to recidivism among native Canadians than among European Canadians. Finally, Stockdale, Olver, and Wong (2010) examined youth recidivism and adult recidivism separately in a sample of 161 adolescents who were followed for 7 years. They reported that PCL:YV ratings were consistently better predictors of youth than of adult recidivism. Although psychopathy ratings predicted recidivism during adolescence among both native Canadians and European Canadians, recidivism during adulthood among native Canadians was predicted robustly only when ratings on the Antisocial facet of the PCL:YV were included as a predictor. Additionally, prediction was somewhat poorer among European Canadians than among native Canadians, presumably due to the smaller *n* for the former and consequent reduction in power. In summary, although the ethnicity findings are themselves somewhat inconsistent, current findings suggest the possibility that ethnicity and related sociodemographic factors (including SES) may moderate the association between psychopathy and recidivism (see Verona et al., 2010, for a review). More concretely, it is plausible that the relationship between psychopathic traits and recidivism may be strongest for native Canadian youth, slightly weaker for youth of European origin, and weaker still for African American and Latino youth.

One of the few experimental domains in which the impact of ethnic differences has been systematically examined is that of passive avoidance learning. Kosson and colleagues (1990) reported similar passive avoidance learning deficits in samples of African American and European American offenders with psychopathic traits, although the deficit emerged as only a statistical trend in the former group. In contrast, two subsequent studies of passive avoidance learning in high PCL-R offenders indicated relatively smaller effects for psychopathy in African American samples than in European American samples (Newman & Schmitt, 1998), and in one of these studies, effects for African American and Latino prisoners failed to even approach significance (Thornquist & Zuckerman, 1995). Nevertheless, it should be noted that Newman and Schmitt (1998), like Kosson and colleagues, found no significant Psychopathy × Ethnicity interaction for passive avoidance errors.

In addition to studies examining passive avoidance learning, contrasting patterns of results have also emerged between high PCL-R African American and European American subgroups in studies investigating response modulation (Newman, Schmitt, & Voss, 1997), responses to distractors under divided visual attention (Kosson, 1998), Damasio's somatic marker hypothesis (Schmitt, Brinkley, & Newman, 1999), interpersonal and cognitive appraisals (Doninger & Kosson, 2001), and affective lexical decision (Lorenz & Newman, 2002b). Ethnic group differences were also found in a study of younger participants by Kimonis, Frick, Fazekas, and Loney (2006), who reported that psychopathic traits, measured with the APSD, were associated with reduced attentional bias toward distress cues among European American but not ethnic/minority youth. Although these studies have addressed different aspects of cognitive and emotional processing, the overall pattern of results suggests that there are important differences in the ways that African American and European Americans with psychopathic traits process information. However, whether these differences reflect true ethnicity-related differences in neurocognitive functioning remains unclear.

At least one alternative possibility should be considered. Given the potential influence of antisocial behavior in rating several PCL-R items, a salient history of violent and criminal behavior can elevate scores on several PCL-R items. Thus, evidence that on average African Americans are arrested and convicted more often than European Americans, and have more charges and convictions for violent offenses than European Americans (Kosson et al., 1990; Sullivan et al., 2006), could contribute to African Americans receiving higher PCL-R scores in some samples. Even in the absence of evidence for differential functioning of PCL-R items related to antisocial behavior (Cooke et al., 2001; cf. Bolt, Hare, Vitale, & Newman, 2004), ethnicity-related differences in criminal records may result in less effective differentiation between middle- and high-psychopathy groups in African American as compared to European American inmate samples; that is, it may be that there are more "false positives" (i.e., individuals not truly high in psychopathic traits who receive high PCL-R scores) among African American participants. In this context, extreme group analyses may contribute to spurious differences between African American and European American individuals with high psychopathy scores, and analyses of continuous data may be more suitable for investigating ethnicity effects.

# Is There Evidence for Psychopathy across Cultures?

A primary goal of this chapter has been to examine the evidence for the cross-cultural validity of psychopathy. Our systematic comparison of findings for North American and international samples indicates substantial evidence for the applicability and utility of the construct of psychopathy in international samples, with some notable differences, and some clear gaps in the literature. One cross-cultural difference that has emerged across studies is the finding of lower mean PCL-R scores and lower base rates for psychopathy in international prison samples. We have discussed several potential explanations for this difference. Interestingly, the moderate observed differences between average PCL-R scores obtained for North American versus European prisoners appear to be driven mainly by British samples, suggesting that these differences might be attributable to the way criminal justice systems in different countries identify and respond to mental illness. Cross-national differences in base rates of psychopathy have also been reported among incarcerated youth. In the event that observed differences in mean-level scores are found to reflect actual cultural influences, instruments may need to be modified to successfully measure psychopathy in varied cultural contexts.

The majority of studies reviewed in this chapter have suggested that relationships between PCL-R psychopathy and scores on clinical and questionnaire measures are generally comparable across cultures. However, some investigations provide preliminary evidence that there may be cultural variation in the relevance of some of the PCL-R indicators to the construct of psychopathy. Additionally, studies using variants of the PCL in samples of children and adolescents provide evidence for a similar factor structure across North American and international samples, although some earlier international studies produced findings suggesting differences in factor structure across cultural groups.

Despite the existence of some differences and the relative lack of research on mechanisms underlying psychopathy in international samples, the majority of available data provide compelling evidence that the construct of psychopathy, as indexed by the PCL-R (and more tentatively other inventories), is valid across cultures. Most important, international studies indicate relationships akin to those observed in North American samples for psychopathy scores with criterion measures of various types-including other psychiatric diagnoses, self-report personality traits, criminal behavior, violent and nonviolent reoffending, and, to some extent, behavioral and physiological response in laboratory tasks. Much of this evidence has been corroborated in studies with youth.

In summary, available research findings indicate that psychopathy is similar in many respects across cultures. However, further research is needed to clarify the basis of cross-cultural differences in mean psychopathy scores, and in the relations of specific components of psychopathy with some constructs in the nomological network surrounding it, including associations of specific components of psychopathy with personality traits, psychopathology, antisocial behavior, and physiological reactivity.

# Is There Evidence for Differences in Psychopathy across Ethnicities?

In this chapter, we have also sought to systematically review literature that has addressed the question of ethnic differences in psychopathy. Although much of the North American psychopathy literature is based on samples that are ethnically diverse, very few studies have systematically tested for differences in the properties and correlates of established psychopathy measures across ethnic groups. Nevertheless, our review indicates substantial evidence for the applicability and utility of the construct of psychopathy in members of different ethnic groups. In particular, psychopathy, as assessed by the PCL-R, appears to exhibit good internal consistency and reliable relationships with personality variables and criminal behavior indices in different ethnic groups, including African Americans, Latino Americans, and native North Americans.

At the same time, our review has identified some potential differences in the nature of psychopathy across ethnicity. These differences fall into two major categories: (1) domains in which findings are inconsistent across studies and across methods, and (2) domains in which differences emerge consistently. The major areas of inconsistency are with respect to ethnic differences in mean PCL-R scores and subdimensions underlying psychopathy. Whether the small differences in total scores reported in some studies reflect true differences in levels of psychopathy across ethnic groups (within certain settings), sociocultural influences on the scoring of specific items, or the impact of racial biases, have yet to be disentangled. The other area of inconsistent findings pertains to factor structure, with some earlier EFA findings suggesting differences in factor structure, and more recent CFA findings pointing to general similarity in underlying structure. As a result, one of our chief conclusions is that more systematic studies of ethnicity and psychopathy across a range of different settings are urgently needed.

There do appear to be relatively consistent differences between African Americans and European Americans in relationships of psychopathy scores with some criterion variables, in particular with self-reported Impulsivity and Psychoticism, and responses in laboratory paradigms assessing cognitive and emotional processing. These differences raise the possibility of distinct mechanisms underlying psychopathy in African American as compared to European American prisoners. In addition, our review of studies also suggests an important difference between Latino Americans and other ethnic groups with respect to the relationship between psychopathy and violent recidivism. However, the small number of studies conducted in these areas precludes drawing firm conclusions about the stability or meaning of these differences.

In summary, two conclusions appear warranted at this point: (1) There *is* evidence for the reliability and partial construct validity of psychopathy across ethnicities, and (2) there *may* be ethnic differences in the manifestations of psychopathy and in the mechanisms underlying psychopathy.

# **Concluding Remarks**

Although it is not one of our stated goals of this chapter, questions regarding potential explanations for the observed differences across cultures and ethnicities have emerged through our review of the literature. At some points we have attempted to provide a framework for evaluating findings, without fully considering the wide array of possible mechanisms that may underlie these differences. More extensive discussions of factors contributing to differences in psychopathy across cultures are available in reviews by Cooke (1998) and Skeem and colleagues (2003). These discussions have focused on issues as diverse as sensation seeking and migration (Cooke, 1998), the impact of culture and ethnicity on early childhood environment and socialization (Lykken, 1995; Mealey, 1995), and the role of differing cultural perspectives on the relationship of the individual to society (Cooke, 1998; Mealey, 1995). The breadth of explanations advanced to account for cultural and ethnic differences in psychopathy provides many avenues for future research into the complex factors that contribute to the development and maintenance of psychopathy.

In conclusion, our review has demonstrated the importance of considering ethnic and cultural factors when assessing and examining psychopathy among youth and adults. Given continuing growth and development in the field of psychopathy research, we hope that the issues we have touched on will receive more systematic exploration. Considering ethnic and cultural variations in psychopathy is not merely a matter of practical significance. By exploring ethnic and cultural similarities and differences in psychopathy and related forms of psychopathology, we can gain greater insight into the etiology of this distinct clinical condition and an improved understanding of the interplay of biological and social factors in its expression.

#### REFERENCES

- Adams, G., & Markus, H. R. (2004). Toward a conception of culture suitable for a social psychology of culture. In M. Schaller & C. S. Crandall (Eds.), *The psychological foundations of culture* (pp. 335–360). Mahwah, NJ: Erlbaum.
- af Klinteberg, B., Humble, K., & Schalling, D. (1992). Personality and psychopathy of males with a history of early criminal behaviour. *European Journal of Per*sonality, 6, 245–266.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: Author.
- Anastassiou-Hadjicharalambous, X., & Warden, D. (2008). Physiologically-indexed and self-perceived affective empathy in conduct-disordered children high and low on callous–unemotional traits. Child Psychiatry and Human Development, 39(4), 503–517.
- Andersen, H. S., Sestoft, D., Lillebaek, T., Mortensen, E. L., & Kramp, P. (1999). Psychopathy and psycho-

pathological profiles in prisoners on remand. Acta Psychiatrica Scandinavica, 99, 33–39.

- Andershed, H. (2014, June). The assessment of psychopathic personality in childhood. Paper presented at the Criminology Symposium, Stockholm, Sweden.
- Andershed, H., Gustafson, S. B., Kerr, M., & Stattin, H. (2002). The usefulness of self-reported psychopathylike traits in the study of antisocial behaviour among non-referred adolescents. *European Journal of Personality*, 16(5), 383–402.
- Andershed, H., Hodgins, S., & Tengström, A. (2007). Convergent validity of the Youth Psychopathic Traits Inventory (YPI): Association with the Psychopathy Checklist: Youth Version (PCL:YV). Assessment, 14, 144–154.
- Ansel, L. L., Barry, C. T., Gillen, C. T., & Herrington, L. L. (2015). An analysis of four self-report measures of adolescent callous–unemotional traits: Exploring unique prediction of delinquency, aggression, and conduct problems. *Journal of Psychopathology and Behavioral Assessment*, 37, 207–216.
- Barry, C. T., Frick, P. J., DeShazo, T. M., McCoy, M., Ellis, M., & Loney, B. R. (2000). The importance of callous–unemotional traits for extending the concept of psychopathy to children. *Journal of Abnormal Psychology*, 109(2), 335–340.
- Bauer, D. L., Whitman, L. A., & Kosson, D. S. (2011). Reliability and construct validity of Psychopathy Checklist Youth Version scores among incarcerated adolescent girls. *Criminal Justice and Behavior*, 38(10), 965–987.
- Blackburn, R. (2007). Personality disorder and antisocial deviance: Comments on the debate on the structure of the Psychopathy Checklist—Revised. Journal of Personality Disorders, 21, 142–159.
- Blackburn, R., & Coid, J. W. (1998). Psychopathy and the dimensions of personality disorder in violent offenders. Personality and Individual Differences, 25, 129–145.
- Blackburn, R., Logan, C., Donnelly, J., & Renwick, S. (2003). Personality disorders, psychopathy and other mental disorders: Co-morbidity among prisoners at English and Scottish high-security hospitals. *Journal* of Forensic Psychiatry and Psychology, 14, 111–137.
- Blackburn, R., Logan, C., Renwick, S. J., & Donnelly, J. P. (2005). Higher-order dimensions of personality disorder: Hierarchical structure and relationships with the five-factor model, the interpersonal circle, and psychopathy. *Journal of Personality Disorders*, 19(6), 597–623.
- Blair, R. J. R. (2013). The neurobiology of psychopathic traits in youths. *Nature Reviews Neuroscience*, 14(11), 786–799.
- Blair, R. J. R., Budhani, S., Colledge, E., & Scott, S. (2005). Deafness to fear in boys with psychopathic tendencies. *Journal of Child Psychology and Psychiatry*, 46(3), 327–336.
- Blair, R. J. R., Colledge, E., Murray, L., & Mitchell, D. G. V. (2001). A selective impairment in the process-

ing of sad and fearful expressions in children with psychopathic tendencies. *Journal of Abnormal Child Psychology*, 29(6), 491–498.

- Blair, R. J. R., Mitchell, D. G. V., Richell, R. A., Kelly, S., Leonard, A., Newman, C., et al. (2002). Turning a deaf ear to fear: Impaired recognition to vocal affect in psychopathic individuals. *Journal of Abnormal Psychology*, 111, 682–686.
- Bolt, D. M., Hare, R. D., Vitale, J. E., & Newman, J. P. (2004). A multigroup item response theory analysis of the Psychopathy Checklist—Revised. *Psychological Assessment*, 16, 155–168.
- Brandt, J. R., Kennedy, W. A., Patrick, C. J., & Curtin, J. J. (1997). Assessment of psychopathy in a population of incarcerated adolescent offenders. *Psychological Assessment*, 9, 429–435.
- Christian, R. E., Frick, P. J., Hill, N. L., Tyler, L., & Frazer, D. R. (1997). Psychopathy and conduct problems in children: II. Implications for subtyping children with conduct problems. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36(2), 233–241.
- Cleckley, H. (1982). The mask of sanity. St. Louis, MO: Mosby.
- Coid, J., & Yang, M. (2011). The impact of psychopathy on violence among the household population of Great Britain. Social Psychiatry and Psychiatric Epidemiology, 46(6), 473–480.
- Coid, J., Yang, M., Ullrich, S., Roberts, A., Moran, P., Bebbington, P., et al. (2009). Psychopathy among prisoners in England and Wales. *International Journal* of Law and Psychiatry, 32(3), 134–141.
- Colins, O. F., Andershed, H., Frogner, L., Lopez-Romero, L., Veen, V., & Andershed, A. K. (2014). A new measure to assess psychopathic personality in children: The Child Problematic Traits Inventory. Journal of Psychopathology and Behavioral Assessment, 36(1), 4–21.
- Colins, O. F., Bijttebier, P., Broekaert, E., & Andershed, H. (2014). Psychopathic-like traits among detained female adolescents: Reliability and validity of the Antisocial Process Screening Device and the Youth Psychopathic Traits Inventory. Assessment, 21(2), 195–209.
- Colins, O. F., Fanti, K. A., Larsson, H., & Andershed, H. (2016). Psychopathic traits in early childhood: Further validation of the child problematic traits inventory. Assessment. [Epub ahead of print]
- Colins, O. F., Noom, M., & Vanderplasschen, W. (2012). Youth Psychopathic Traits Inventory–Short Version: A further test of the internal consistency and criterion validity. *Journal of Psychopathology and Behavioral* Assessment, 34(4), 476–486.
- Cooke, D. J. (1995). Psychopathic disturbance in the Scottish prison population: Cross-cultural generalizability of the Hare Psychopathy Checklist. Psychology, Crime and Law, 2, 101–118.
- Cooke, D. J. (1998). Psychopathy across cultures. In D. J. Cooke, A. E. Forth, & R. D. Hare (Eds.), Psy-

chopathy: Theory, research and implications for society (pp. 13–45). Dordrecht, The Netherlands: Kluwer.

- Cooke, D. J., Kosson, D. S., & Michie, C. (2001). Psychopathy and ethnicity: Structural, item and test generalizability of the Psychopathy Checklist—Revised (PCL-R) in Caucasian and African American participants. Psychological Assessment, 13, 531–542.
- Cooke, D. J., & Michie, C. (1999). Psychopathy across cultures: North America and Scotland compared. *Journal of Abnormal Psychology*, 108, 58–68.
- Cooke, D. J., & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment*, 13, 171–188.
- Cooke, D. J., Michie, C., & Hart, S. D. (2006). Facets of clinical psychopathy: Toward clearer measurement. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 91–106). New York: Guilford Press.
- Cooke, D. J., Michie, C., Hart, S. D., & Clark, D. (2005a). Assessing psychopathy in the UK: Concerns about cross-cultural generalisability. *British Journal of Psychiatry*, 186(4), 335–341.
- Cooke, D. J., Michie, C., Hart, S. D., & Clark, D. (2005b). Searching for the pan-cultural core of psychopathic personality disorder. *Personality and Indi*vidual Differences, 39(2), 283–295.
- Copestake, S., Gray, N., & Snowden, R. (2011). A comparison of a self-report measure of psychopathy with the Psychopathy Checklist—Revised in a UK sample of offenders. *Journal of Forensic Psychiatry and Psychology*, 22, 169–182.
- Costello, A. B., & Osborne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical As*sessment, Research and Evaluation, 10(7), 1–9.
- Dadds, M. R., El Masry, Y., Wimalaweera, S., & Guastella, A. J. (2008). Reduced eye gaze explains "fear blindness" in childhood psychopathic traits. *Journal* of the American Academy of Child and Adolescent Psychiatry, 47(4), 455–463.
- Dadds, M. R., Fraser, J., Frost, A., & Hawes, D. J. (2005). Disentangling the underlying dimensions of psychopathy and conduct problems in childhood: A community study. *Journal of Consulting and Clinical Psychology*, 73(3), 400–410.
- Dadds, M. R., Perry, Y., Hawes, D. J., Merz, S., Riddell, A. C., Haines, D. J., et al. (2006). Attention to the eyes and fear-recognition deficits in child psychopathy. *British Journal of Psychiatry*, 189(3), 280–281.
- Das, J., de Ruiter, C., Doreleijers, T., & Hillege, S. (2009). Reliability and construct validity of the Dutch Psychopathy Checklist: Youth Version: Findings from a sample of male adolescents in a juvenile justice treatment institution. Assessment, 16(1), 88–102.
- Das, J., De Ruiter, C., Lodewijks, H., & Doreleijers, T. (2007). Predictive validity of the Dutch PCL:YV for institutional disruptive behavior: Findings from two samples of male adolescents in a juvenile justice treatment institution. Behavioral Sciences and the Law, 25(5), 739–755.

- Dawel, A., O'Kearney, R., McKone, E., & Palermo, R. (2012). Not just fear and sadness: Meta-analytic evidence of pervasive emotion recognition deficits for facial and vocal expressions in psychopathy. *Neuroscience and Biobehavioral Reviews*, 36, 2288–2304.
- de Tribolet-Hardy, F., Vohs, K., Mokros, A., & Habermeyer, E. (2014). Psychopathy, intelligence, and impulsivity in German violent offenders. *International journal of Law and Psychiatry*, 37(3), 238–244.
- de Wied, M., van Boxtel, A., Matthys, W., & Meeus, W. (2012). Verbal, facial and autonomic responses to empathy-eliciting film clips by disruptive male adolescents with high versus low callous–unemotional traits. Journal of Abnormal Child Psychology, 40, 211–223.
- de Wied, M., van der Baan, H., Raaijmakers, Q., de Ruiter, C., & Meeus, W. (2014). Factor structure and construct validity of the Dutch version of the Antisocial Process Screening Device. Journal of Psychopathology and Behavioral Assessment, 36(1), 84–92.
- Dolan, M., & Rennie, C. (2006). Psychopathy Checklist: Youth Version and Youth Psychopathic Traits Inventory: A comparison study. *Personality and Indi*vidual Differences, 41, 779–789.
- Doninger, N. A., & Kosson, D. S. (2001). Interpersonal construct systems among psychopaths. *Personality* and Individual Differences, 30, 1263–1281.
- Doyle, M., Dolan, M., & McGovern, J. (2002). The validity of North American risk assessment tools in predicting in-patient violent behaviour in England. *Legal and Criminological Psychology*, 7, 141–154.
- Drislane, L. E., Patrick, C. J., & Arsal, G. (2014). Clarifying the content coverage of differing psychopathy inventories through reference to the Triarchic Psychopathy Measure. *Psychological Assessment*, 26, 350–362.
- Edens, J. F., & Cahill, M. A. (2007). Psychopathy in adolescence and criminal recidivism in young adulthood longitudinal results from a multiethnic sample of youthful offenders. Assessment, 14(1), 57–64.
- Edens, J. F., Campbell, J. S., & Weir, J. M. (2007). Youth psychopathy and criminal recidivism: A meta-analysis of the psychopathy checklist measures. *Law and Human Behavior*, 31(1), 53–75.
- Eisenbarth, H., Demetriou, C. A., Kyranides, M. N., & Fanti, K. A. (2016). Stability subtypes of callous unemotional traits and conduct disorder symptoms and their correlates. *Journal of Youth and Adolescence*, 45, 1889–1901.
- Eisenbarth, H., Osterheider, M., Nedopil, N., & Stadtland, C. (2012). Recidivism in female offenders: PCL-R lifestyle factor and VRAG show predictive validity in a German sample. *Behavioral Sciences and the Law*, 30(5), 575–584.
- Endrass, J., Rossegger, A., Urbaniok, F., Laubacher, A., & Vetter, S. (2008). Predicting violent infractions in a Swiss state penitentiary: A replication study of the PCL-R in a population of sex and violent offenders. BMC Psychiatry, 8, Article 74.

- Enebrink, P., Andershed, H., & Långström, N. (2005). Callous–unemotional traits are associated with clinical severity in referred boys with conduct problems. *Nordic Journal of Psychiatry*, 59(6), 431–440.
- Essau, C. A., Sasagawa, S., & Frick, P. J. (2006). Callous-unemotional traits in a community sample of adolescents. Assessment, 13(4), 454–469.
- Eysenck, H. J. (1991). Dimensions of personality: 16, 5 or 3?: Criteria for a taxonomic paradigm. *Personality and Individual Differences*, 12(8), 773–790.
- Fairchild, G., Stobbe, Y., Van Goozen, S. H., Calder, A. J., & Goodyer, I. M. (2010). Facial expression recognition, fear conditioning, and startle modulation in female subjects with conduct disorder. *Biological Psychiatry*, 68(3), 272–279.
- Fanti, K. A. (2013). Individual, social, and behavioral factors associated with co-occurring conduct problems and callous–unemotional traits. *Journal of Abnormal Child Psychology*, 41(5), 811–824.
- Fanti, K. A. (2016). Understanding heterogeneity in conduct disorder: A review of psychophysiological studies. *Neuroscience and Biobehavioral Reviews*. [Epub ahead of print]
- Fanti, K. A., & Centifanti, L. C. M. (2014). Childhood callous–unemotional traits moderate the relation between parenting distress and conduct problems over time. Child Psychiatry and Human Development, 45(2), 173–184.
- Fanti, K. A., Colins, O. F., Andershed, H., & Sikki, M. (2017). Stability and change in callous–unemotional traits: Longitudinal associations with potential individual and contextual risk and protective factors. *American Journal of Orthopsychiatry*, 87(1), 62–75.
- Fanti, K. A., Demetriou, C. A., & Kimonis, E. R. (2013). Variants of callous–unemotional conduct problems in a community sample of adolescents. *Journal of Youth and Adolescence*, 42(7), 964–979.
- Fanti, K. A., Frick, P. J., & Georgiou, S. (2009). Linking callous–unemotional traits to instrumental and noninstrumental forms of aggression. Journal of Psychopathology and Behavioral Assessment, 31(4), 285–298.
- Fanti, K. A., & Kimonis, E. R. (2012). Bullying and victimization: The role of conduct problems and psychopathic traits. *Journal of Research on Adolescence*, 22(4), 617–631.
- Fanti, K. A., & Kimonis, E. R. (2013). Dimensions of juvenile psychopathy distinguish "bullies," "bullyvictims," and "victims." *Psychology of Violence*, 3(4), 396–409.
- Fanti, K. A., & Kimonis, E. (2017). Heterogeneity in externalizing problems at age 3: Association with age 15 biological and environmental outcomes. *Developmental Psychology*, 53(7), 1230–1241.
- Fanti, K. A., Kyranides, M., Drislane, L. E., Colins, O. F., & Andershed, H. (2016). Validation of the Greek Cypriot translation of the Triarchic Psychopathy Measure. *Journal of Personality Assessment*, 98, 146–154.
- Fanti, K. A., Panayiotou, G., Lazarou, C., Michael, R., & Georgiou, G. (2016). The better of two evils?: Evi-

dence that children exhibiting continuous conduct problems high or low on callous–unemotional traits score on opposite directions on physiological and behavioral measures of fear. *Development and Psychopathology*, 28, 185–198.

- Feilhauer, J., Cima, M., & Arntz, A. (2012). Assessing callous–unemotional traits across different groups of youths: Further cross-cultural validation of the Inventory of Callous–Unemotional Traits. International Journal of Law and Psychiatry, 35(4), 251–262.
- Felthous, A. R., & Sass, H. (2000). Introduction to this issue: International perspectives on psychopathic disorder. Behavioral Sciences and the Law, 18, 557–565.
- Flores-Mendoza, C. E., Alvarenga, M. A. S., Herrero, Ó., & Abad, F. J. (2008). Factor structure and behavioural correlates of the Psychopathy Checklist-Revised (PCL-R) in a Brazilian prisoner sample. *Personality and Individual Differences*, 45(7), 584–590.
- Fontaine, N. M., Rijsdijk, F. V., McCrory, E. J., & Viding, E. (2010). Etiology of different developmental trajectories of callous–unemotional traits. *Journal of* the American Academy of Child and Adolescent Psychiatry, 49(7), 656–664.
- Forth, A. (1992). Emotion and psychopathy: A threecomponent analysis. Unpublished doctoral dissertation, University of British Columbia, Vancouver, BC, Canada.
- Forth, A. E., Kosson, D. S., & Hare, R. D. (2003). Hare Psychopathy Checklist: Youth Version (PCL:YV). Toronto: Multi-Health Systems.
- Freese, R., Sommer, J., Muller-Isberner, R., & Ozokyay, K. (1999, November). The PCL:SV as an instrument to predict violence in in-patients in a German hospital order institution. Paper presented at the conference on Risk Assessment and Risk Management, Vancouver, BC, Canada.
- Frick, P. J. (2009). Extending the construct of psychopathy to youth: Implications for understanding, diagnosing, and treating antisocial children and adolescents. *Canadian Journal of Psychiatry*, 31(12), 803–812.
- Frick, P. J., Bodin, S. D., & Barry, C. T. (2000). Psychopathic traits and conduct problems in community and clinic-referred samples of children: Further development of the psychopathy screening device. Psychological Assessment, 12(4), 382–393.
- Frick, P. J., Cornell, A. H., Bodin, S. D., Dane, H. E., Barry, C. T., & Loney, B. R. (2003). Callous–unemotional traits and developmental pathways to severe conduct problems. *Developmental Psychology*, 39(2), 246–260.
- Frick, P. J., Lilienfeld, S. O., Ellis, M., Loney, B., & Silverthorn, P. (1999). The association between anxiety and psychopathy dimensions in children. *Journal of Abnormal Child Psychology*, 27(5), 383–392.
- Frick, P. J., & Moffitt, T. E. (2010). A proposal to the DSM-V childhood disorders and the ADHD and disruptive behavior disorders work groups to include a specifier to the diagnosis of conduct disorder based on the pres-

ence of callous–unemotional traits. Washington, DC: American Psychiatric Association.

- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014). Annual research review: A developmental psychopathology approach to understanding callous–unemotional traits in children and adolescents with serious conduct problems. *Journal of Child Psychology and Psychiatry*, 55(6), 532–548.
- Frick, P. J., & Viding, E. (2009). Antisocial behavior from a developmental psychopathology perspective. *Development and Psychopathology*, 21(4), 1111–1131.
- Fritz, M. V., Wiklund, G., Koposov, R. A., af Klinteberg, B., & Ruchkin, V. V. (2008). Psychopathy and violence in juvenile delinquents: What are the associated factors? *International Journal of Law and Psychiatry*, 31(3), 272–279.
- Fung, A. L., Gao, Y., & Raine, A. (2010). The utility of the child and adolescent psychopathy construct in Hong Kong, China. *Journal of Clinical Child and Adolescent Psychology*, 39, 134–140.
- Fung, M. T., Raine, A., Loeber, R., Lynam, D. R., Steinhauer, S. R., Venables, P. H., et al. (2005). Reduced electrodermal activity in psychopathy-prone adolescents. *Journal of Abnormal Psychology*, 114(2), 187– 196.
- Gonçalves, R. A. (1999). Psychopathy and offender types: Results from a Portuguese prison sample. International Journal of Law and Psychiatry, 22, 337–346.
- Graham, J. R. (1987). The MMPI: A practical guide. New York: Oxford University Press.
- Grann, M., Langstrom, N., Tengstrom, A., & Kullgren, G. (1999). Psychopathy (PCL-R) predicts violent recidivism among criminal offenders with personality disorders in Sweden. *Law and Human Behavior*, 23, 205–217.
- Greene, R. L. (2000). The MMPI-2: An interpretive manual. Boston: Allyn & Bacon.
- Habermeyer, E., Passow, D., & Vohs, K. (2010). Is psychopathy elevated among criminal offenders who are under preventive detention pursuant to Section 66 of the German Penal Code? *Behavioral Sciences and the Law*, 28, 267–276.
- Hale, L. R., Goldstein, D. S., Abramowitz, C. S., Calamari, J. E., & Kosson, D. S. (2004). Psychopathy is related to negative affectivity but not to anxiety sensitivity. Behaviour Research and Therapy, 42, 697–710.
- Hare, R. D. (1978). Electrodermal and cardiovascular correlates of psychopathy. In R. D. Hare & D. Schalling (Eds.), *Psychopathic behavior: Approaches to research* (pp. 107–144). New York: Wiley.
- Hare, R. D. (1980). A research scale for the assessment of psychopathy in criminal populations. *Personality* and Individual Differences, 1, 111–119.
- Hare, R. D. (1991). Hare Psychopathy Checklist—Revised (PCL-R). Toronto: Multi-Health Systems.
- Hare, R. D. (1999). Psychopathy as a risk factor for violence. Psychiatric Quarterly, 70, 181–197.
- Hare, R. D. (2003). Hare Psychopathy Checklist—Revised (PCL-R) (2nd ed.). Toronto: Multi-Health Systems.

- Hare, R. D., Clark, D., Grann, M., & Thornton, D. (2000). Psychopathy and the predictive validity of the PCL-R: An international perspective. *Behavioral Sciences and the Law*, 18, 623–645.
- Hare, R. D., Harpur, T. J., Hakstian, A. R., Forth, A. E., Hart, S. D., & Newman, J. P. (1990). The revised Psychopathy Checklist: Reliability and factor structure. *Psychological Assessment*, 2, 338–341.
- Hare, R. D., & McPherson, L. E. (1984). Violent and aggressive behavior by criminal psychopaths. International Journal of Law and Psychiatry, 7, 35–50.
- Hare, R. D., & Neumann, C. S. (2005). Structural models of psychopathy. Current Psychiatry Reports, 7(1), 57–64.
- Harpur, T. J., Hakstian, A. R., & Hare, R. D. (1988). Factor structure of the Psychopathy Checklist. Journal of Consulting and Clinical Psychology, 56, 741–747.
- Hart, S. D., Cox, D. N., & Hare, R. D. (1995). Hare Psychopathy Checklist: Screening Version (PCL:SV). Toronto: Multi-Health Systems.
- Hart, S. D., Forth, A. E., & Hare, R. D. (1991). The MCMI-II as a measure of psychopathy. *Journal of Per*sonality Disorders, 5, 318–327.
- Hart, S. D., & Hare, R. D. (1989). Discriminant validity of the Psychopathy Checklist in a forensic psychiatric population. *Psychological Assessment*, 1, 211–218.
- Heilbrun, K., Hart, S. D., Hare, R. D., Gustafson, D., Nunez, C., & White, A. J. (1998). Inpatient and postdischarge aggression in mentally disordered offenders: The role of psychopathy. *Journal of Interpersonal Violence*, 13, 514–527.
- Hemphälä, M., Kosson, D. S., Westerman, J., & Hodgins, S. (2015). Stability and predictors of psychopathic traits from mid-adolescence through early adulthood. *Scandinavian Journal of Psychology*, 56, 649–658.
- Hemphill, J. F., Hart, S. D., & Hare, R. D. (1994). Psychopathy and substance abuse. *Journal of Personality Disorders*, 8, 169–180.
- Hemphill, J. F., Templeman, R., Wong, S., & Hare, R. D. (1998). Psychopathy and crime: Recidivism and criminal careers. In D. J. Cooke, A. E. Forth, & R. D. Hare (Eds.), Psychopathy: Theory, research and implications for society (pp. 375–399). Dordrecht, The Netherlands: Kluwer.
- Hicks, B. M., Markon, K. E., Patrick, C. J., Krueger, R. F., & Newman, J. P. (2004). Identifying psychopathy subtypes on the basis of personality structure. *Psychological Assessment*, 16, 276–288.
- Hildebrand, M., & de Ruiter, C. (2004). PCL-R psychopathy and its relation to DSM-IV Axis I and II disorders in a sample of male forensic psychiatric patients in the Netherlands. *International Journal of Law and Psychiatry*, 27(3), 233–248.
- Hildebrand, M., de Ruiter, C., de Vogel, V., & van der Wolf, P. (2002). Reliability and factor structure of the Dutch language version of Hare's Psychopathy Checklist—Revised. International Journal of Forensic Mental Health, 1, 139–154.
- Hildebrand, M., de Ruiter, C., & Nijman, H. (2004).

PCL-R psychopathy predicts disruptive behavior among male offenders in a Dutch forensic psychiatric hospital. *Journal of Interpersonal Violence*, 19, 13–29.

- Hillege, S., Das, J., & de Ruiter, C. (2010). The Youth Psychopathic Traits Inventory: Psychometric properties and its relation to substance use and interpersonal style in a Dutch sample of non-referred adolescents. *Journal of Adolescence*, 33(1), 83–91.
- Hipwell, A. E., Pardini, D. A., Loeber, R., Sembower, M., Keenan, K., & Stouthamer-Loeber, M. (2007). Callous–unemotional behaviors in young girls: Shared and unique effects relative to conduct problems. *Journal of Clinical Child and Adolescent Psychol*ogy, 36, 293–304.
- Hobson, J., & Shine, J. (1998). Measurement of psychopathy in a UK prison population referred for long-term psychotherapy. *British Journal of Criminol*ogy, 38, 504–516.
- Hoff, H. A., Rypdal, K., Mykletun, A., & Cooke, D. J. (2012). A prototypicality validation of the Comprehensive Assessment of Psychopathic Personality model (CAPP). Journal of Personality Disorders, 26, 414–427.
- Howard, R., Payamal, L. T., & Neo, L. H. (1997). Response modulation deficits in psychopaths: A failure to confirm and a reconsideration of the Patterson-Newman model. *Personality and Individual Differences*, 22(5), 707–717.
- Huchzermeier, C., Bruß, E., Geiger, F., & Godt, N. (2006). Psychopathy checklist score predicts negative events during the sentences of prisoners with Hare psychopathy: A prospective study at a German prison. Canadian Journal of Psychiatry, 51(11), 692–697.
- Hyde, L. (1999). Trickster makes this world: Mischief, myth, and art. New York: North Point Press.
- Jackson, R. L., Neumann, C. S., & Vitacco, M. J. (2007). Impulsivity, anger, and psychopathy: The moderating effect of ethnicity. *Journal of Personality Disorders*, 21(3), 289–304.
- Jhatial, A. A., Jariko, G. A., Tahrani, A., & Jam, Y. (2013). Psychopathy in management behavior and bullying at work: Hearing some unheard voices from Pakistan. Gomal University Journal of Research, 29, 104–117.
- Jones, A., Laurens, K., Herba, C., Barker, G., & Viding, E. (2009). Amygdala hypoactivity to fearful faces in boys with conduct problems and callous–unemotional traits. *American Journal of Psychiatry*, 166(1), 95–102.
- Jung, C. G. (1964). Man and his symbols. Garden City, NY: Doubleday.
- Kennealy, P. J., Skeem, J. L., Walters, G. D., & Camp, J. (2010). Do core interpersonal and affective traits of PCL-R psychopathy interact with antisocial behavior and disinhibition to predict violence? *Psychological Assessment*, 22(3), 569–580.
- Kim, H., & Eaton, N. R. (2015). The hierarchical structure of common mental disorders: Connecting multiple levels of comorbidity, bifactor models and pre-

dictive validity. *Journal of Abnormal Psychology*, 124, 1064–1078.

- Kimonis, E. R., Fanti, K. A., Isoma, Z., & Donoghue, K. (2013). Maltreatment profiles among incarcerated boys with callous–unemotional traits. *Child Maltreatment*, 18(2), 108–121.
- Kimonis, E. R., Frick, P. J., Cauffman, E., Goldweber, A., & Skeem, J. (2012). Primary and secondary variants of juvenile psychopathy differ in emotional processing. *Development and Psychopathology*, 24(3), 1091–1103.
- Kimonis, E. R., Frick, P. J., Fazekas, H., & Loney, B. R. (2006). Psychopathy, aggression, and the processing of emotional stimuli in non-referred girls and boys. *Behavioral Sciences and the Law*, 24(1), 21–37.
- Kimonis, E. R., Frick, P. J., Skeem, J. L., Marsee, M. A., Cruise, K., Munoz, L. C., et al. (2008). Assessing callous–unemotional traits in adolescent offenders: Validation of the Inventory of Callous–Unemotional Traits. International Journal of Law and Psychiatry, 31(3), 241–252.
- Kosson, D. S. (1998). Divided visual attention in psychopathic and non-psychopathic offenders. *Personality and Individual Differences*, 24, 373–391.
- Kosson, D. S. (2009). Guest editorial: Recent advances in psychopathy research. Canadian Journal of Psychiatry, 54, 787–790.
- Kosson, D. S., Lorenz, A. R., & Newman, J. P. (2006). Effects of comorbid psychopathy on criminal offending and emotion processing in male offenders with antisocial personality disorder. *Journal of Abnormal Psychology*, 115(4), 798–806.
- Kosson, D. S., McBride, C. K., Whitman, L. A., & Riser, R. E. (2017). Testing the affect dysregulation theory of psychopathy: Part 1. The role of chronic anger expression in youth with psychopathic traits. Manuscript submitted for publication.
- Kosson, D. S., Neumann, C. S., Forth, A. E., Salekin, R. T., Hare, R. D., Krischer, M. K., et al. (2013). Factor structure of the Hare Psychopathy Checklist: Youth Version (PCL:YV) in adolescent females. *Psychological Assessment*, 25(1), 71–83.
- Kosson, D. S., Smith, S. S., & Newman, J. P. (1990). Evaluating the construct validity of psychopathy in African American and European American male inmates: Three preliminary studies. *Journal of Abnormal Psychology*, 99, 250–259.
- Kosson, D. S., Suchy, Y., Mayer, A. R., & Libby, J. (2002). Facial affect recognition in criminal psychopaths. *Emotion*, 2, 398–411.
- Kreis, M. K., Cooke, D. J., Michie, C., Hoff, H. A., & Logan, C. (2012). The Comprehensive Assessment of Psychopathic Personality (CAPP): Content validation using prototypical analysis. *Journal of Personality Disorders*, 26, 402–413.
- Kubak, F. A., & Salekin, R. T. (2009). Psychopathy and anxiety in children and adolescents: New insights on developmental pathways to offending. *Journal of Psychopathology and Behavioral Assessment*, 31, 271–284.

- Kyranides, M., Fanti, K. A., & Panayiotou, G. (2016). The disruptive adolescent as a grown-up: Predicting adult startle responses to violent and erotic films from adolescent conduct problems and callous–unemotional traits. *Journal of Psychopathology and Behavioral Assessment*, 38, 183–194.
- Laajasalo, T., Salenius, S., Lindberg, N., Repo-Tiihonen, E., & Häkkänen-Nyholm, H. (2011). Psychopathic traits in Finnish homicide offenders with schizophrenia. *International Journal of Law and Psychiatry*, 34(5), 324–330.
- Lang, S., af Klinteberg, B., & Alm, P. O. (2002). Adult psychopathy and violent behavior in males with early neglect and abuse. Acta Psychiatrica Scandinavica Supplement, 106(412), 93–100.
- Langstrom, N., & Grann, M. (2002). Psychopathy and violent recidivism among young criminal offenders. Acta Psychiatrica Scandinavica, 106, 86–92.
- LaPierre, D., Braun, C. M. J., & Hodgins, S. (1995). Ventral frontal deficits in psychopathy: Neuropsychological test findings. *Neuropsychologia*, 33, 139–151.
- Laurell, J., Belfrage, H., & Hellström, Å. (2010). Facets on the Psychopathy Checklist Screening Version and instrumental violence in forensic psychiatric patients. Criminal Behaviour and Mental Health, 20(4), 285–294.
- Lee, Z., Klaver, J. R., Hart, S. D., Moretti, M. M., & Douglas, K. S. (2009). Short-term stability of psychopathic traits in adolescent offenders. *Journal of Clini*cal Child and Adolescent Psychology, 38(5), 595–605.
- Levenston, G. K., Patrick, C. J., Bradley, M. M., & Lang, P. J. (2000). The psychopath as observer: Emotion and attention in picture processing. *Journal of Abnormal Psychology*, 109, 373–385.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in noncriminal population. *Journal of Personality Assessment*, 66(3), 488–524.
- Lilienfeld, S. O., Fowler, K. A., & Patrick, C. (2006). The self-report assessment of psychopathy. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 107–132). New York: Guilford Press.
- Loney, B. R., Frick, P. J., Clements, C. B., Ellis, M. L., & Kerlin, K. (2003). Callous–unemotional traits, impulsivity, and emotional processing in adolescents with antisocial behavior problems. *Journal of Clinical Child and Adolescent Psychology*, 32, 66–80.
- Lorenz, A. R., & Newman, J. P. (2002a). Deficient response modulation and emotion processing in lowanxious Caucasian psychopathic offenders: Results from a lexical decision task. *Emotion*, 2, 92–104.
- Lorenz, A. R., & Newman, J. P. (2002b). Do emotion and information processing deficiencies found in Caucasian psychopaths generalize to African-American psychopaths? *Personality and Individual Differences*, 32, 1077–1086.
- Lykken, D. T. (1995). The antisocial personalities. Hillsdale, NJ: Erlbaum.

- Lynam, D. R. (1997). Pursuing the psychopath: Capturing the fledgling psychopath in a nomological net. *Journal of Abnormal Psychology*, 106, 425–438.
- Lynam, D. R., Caspi, A., Moffitt, T. E., Loeber, R., & Stouthamer-Loeber, M. (2007). Longitudinal evidence that psychopathy scores in early adolescence predict adult psychopathy. *Journal of Abnormal Psychology*, 116, 155–165.
- Lynam, D. R., Caspi, A., Moffitt, T. E., Raine, A., Loeber, R., & Stouthamer-Loeber, M. (2005). Adolescent psychopathy and the Big Five: Results from two samples. *Journal of Abnormal Child Psychology*, 33(4), 431–443.
- Lynam, D. R., & Derefinko, K. (2006). Psychopathy and personality. In C. J. Patrick (Ed.), *Handbook of* psychopathy (pp. 133–155). New York: Guilford Press.
- Lynam, D., Hoyle, R., & Newman, J. (2006). The perils of partialling: Cautionary tales from aggression and psychopathy. Assessment, 13, 328–341.
- Lynn, R. (2002). Racial and ethnic differences in psychopathic personality. Personality and Individual Differences, 32, 273–316.
- Maesschalck, C., Vertommen, H., & Hooghe, A. (2002). Psychometric characteristics of the Psychopathic Personality Inventory in a Dutch-speaking population. International Journal of Testing, 2, 169–198.
- Manti, E., Scholte, E. M., van Berckelaer-Onnes, I. A., & Van Der Ploeg, J. D. (2009). Social and emotional detachment: A cross-cultural comparison of the nondisruptive behavioural psychopathic traits in children. Criminal Behaviour and Mental Health, 19(3), 178–192.
- Marsella, A. (1987). The measurement of depressive experience and disorder across cultures. In A. Marsella, R. M. Hirschfeld, & M. M. Katz (Eds.), *The measurement of depression* (pp. 376–397). New York: Guilford Press.
- Marsh, A. A., & Blair, R. J. R. (2008). Deficits in facial affect recognition among antisocial populations: A meta-analysis. *Neuroscience and Biobehavioral Re*views, 32, 454–465.
- Marsh, A. A., Finger, E. C., Mitchell, D. G., Reid, M. E., Sims, C., Kosson, D. S., et al. (2008). Reduced amygdala response to fearful expressions in adolescents with callous–unemotional traits and disruptive behavior disorders. *American Journal of Psychiatry*, 165, 712–720.
- McDermott, P. A., Alterman, A. I., Cacciola, J. S., Rutherford, M. J., Newman, J. P., & Mulholland, E. M. (2000). Generality of Psychopathy Checklist—Revised factors over prisoners and substance-dependent patients. *Journal of Consulting and Clinical Psychol*ogy, 68, 181–186.
- Mealey, L. (1995). The sociobiology of sociopathy: An integrated evolutionary model. Behavioral and Brain Sciences, 18, 523–599.
- Miller, G. A., & Chapman, J. C. (2001). Misunderstanding analysis of covariance. *Journal of Abnormal Psychology*, 110, 40–48.

- Mokros, A., Neumann, C. S., Stadtland, C., Osterheider, M., Nedopil, N., & Hare, R. (2011). Assessing measurement invariance of PCL-R assessments from file reviews of North American and German offenders. International Journal of Law and Psychiatry, 34, 56–63.
- Mokros, A., Vohs, K., & Habermeyer, E. (2014). Psychopathy and violent reoffending in German-speaking countries: A meta-analysis. European Journal of Psychological Assessment, 30(2), 117–129.
- Moltó, J., Poy, R., & Torrubia, R. (2000). Standardization of the Hare Psychopathy Checklist—Revised in a Spanish prison sample. *Journal of Personality Disor*ders, 14, 84–96.
- Morana, H. C., Arboleda-Florez, J., & Camara, F. P. (2005). Identifying the cut-off score for the PCL-R scale in a Brazilian forensic population. *Forensic Science International*, 147, 1–8.
- Muñoz, L. C. (2009). Callous–unemotional traits are related to combined deficits in recognizing afraid faces and body poses. Journal of the American Academy of Child and Adolescent Psychiatry, 48, 554–562.
- Muñoz, L. C., & Frick, P. J. (2007). The reliability, stability, and predictive utility of the self-report version of the Antisocial Process Screening Device. Scandinavian Journal of Psychology, 48(4), 299–312.
- Murphy, J. (1976). Psychiatric labeling in cross-cultural perspective. Science, 191, 1019–1027.
- Nedopil, N., Hollweg, M., Hartmann, J., & Jaser, R. (1998). Comorbidity of psychopathy with major mental disorders. In D. J. Cooke, A. E. Forth, & R. D. Hare (Eds.), Psychopathy: Theory, research and implications for society (pp. 257–268). Dordrecht, The Netherlands: Kluwer.
- Neumann, C. S., Johansson, P. T., & Hare, R. D. (2013). The Psychopathy Checklist—Revised (PCL-R), low anxiety, and fearlessness: A structural equation modeling analysis. Personality Disorders: Theory, Research, and Treatment, 4(2), 129–137.
- Neumann, C. S., Schmitt, D. S., Carter, R., Embley, I., & Hare, R. D. (2012). Psychopathic traits in females and males across the globe. *Behavioral Sciences and the Law*, 30, 557–574.
- Neves, A. C., Gonçalves, R. A., & Palma-Oliveira, J. M. (2011). Assessing risk for violent and general recidivism: A study of the HCR-20 and the PCL-R with a non-clinical sample of Portuguese offenders. *International Journal of Forensic Mental Health*, 10, 137–149.
- Newman, J. P., & Kosson, D. S. (1986). Passive avoidance learning in psychopathic and nonpsychopathic offenders. *Journal of Abnormal Psychology*, 95(3), 252–256.
- Newman, J. P., Patterson, C. M., & Kosson, D. S. (1987). Response perseveration in psychopaths. *Journal of Abnormal Psychology*, 96, 145–148.
- Newman, J. P., & Schmitt, W. A. (1998). Passive avoidance in psychopathic offenders: A replication and extension. *Journal of Abnormal Psychology*, 107, 527–532.

- Newman, J. P., Schmitt, W. A., & Voss, W. D. (1997). The impact of motivationally neutral cues on psychopathic individuals: Assessing the generality of the response modulation hypothesis. *Journal of Abnormal Psychology*, 106, 563–575.
- Ogloff, J. R., & Wong, S. (1990). Electrodermal and cardiovascular evidence of a coping response in psychopaths. Criminal Justice and Behavior, 17, 231–245.
- Pastor, M. C., Moltó, J., Vila, J., & Lang, P. J. (2003). Startle reflex modulation, affective ratings and autonomic reactivity in incarcerated Spanish psychopaths. *Psychophysiology*, 40, 934–938.
- Patrick, C. J. (1994). Emotion and psychopathy: Startling new insights. Psychophysiology, 4, 319–330.
- Patrick, C. J., Bradley, M. M., & Lang, P. J. (1993). Emotion in the criminal psychopath: Startle reflex modulation. *Journal of Abnormal Psychology*, 102, 82–92.
- Patrick, C. J., Cuthbert, B. N., & Lang, P. J. (1994). Emotion in the criminal psychopath: Fear image processing. *Journal of Abnormal Psychology*, 103, 523–534.
- Patrick, C. J., & Drislane, L. E. (2015). Triarchic model of psychopathy: Origins, operationalizations, and observed linkages with personality and general psychopathology. *Journal of Personality*, 83(6), 627–643.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, 21(3), 913–938.
- Patrick, C. J., Hicks, B. M., Nichol, P. E., & Krueger, R. F. (2007). A bifactor approach to modeling the structure of the Psychopathy Checklist—Revised. *Journal* of Personality Disorders, 21, 118–141.
- Patterson, C. M. (1991). Emotion and interpersonal sensitivity in psychopaths. Unpublished doctoral dissertation, University of Wisconsin–Madison.
- Pechorro, P., Barroso, R., Maroco, J., Vieira, R. X., & Gonçalves, R. A. (2015). Psychometric properties of the Psychopathy Checklist: Youth Version among Portuguese juvenile delinquents. International Journal of Offender Therapy and Comparative Criminology, 59, 1322–1337.
- Pechorro, P., Maroco, J., Gonçalves, R. A., Nunes, C., & Jesus, S. N. (2014). Psychopathic traits and age of crime onset in male juvenile delinquents. *European Journal of Criminology*, 11, 288–302.
- Pechorro, P., Maroco, J., Poiares, C., & Vieira, R. X. (2013). Validation of the Portuguese version of the Antisocial Process Screening Device–Self-Report with a focus on delinquent behavior and behavior problems. International Journal of Offender Therapy and Comparative Criminology, 57(1), 112–126.
- Pechorro, P., Ray, J. V., Barroso, R., Maroco, J., & Gonçalves, R. A. (2016). Validation of the inventory of callous–unemotional traits among a Portuguese sample of detained juvenile offenders. *International Journal of Offender Therapy and Comparative Crimi*nology, 60, 349–365.
- Pedersen, L., Kunz, C., Rasmussen, K., & Elsass, P.

(2010). Psychopathy as a risk factor for violent recidivism: Investigating the Psychopathy Checklist Screening Version (PCL: SV) and the Comprehensive Assessment of Psychopathic Personality (CAPP) in a forensic psychiatric setting. *International Journal of Forensic Mental Health*, 9, 308–315.

- Pham, T. H. (1998). Evaluation psychométrique du questionnaire de la psychopathie de Hare auprès d'une population carcérale belge. L'Encéphale, 24, 435–441.
- Pham, T. H., Philippot, P., & Rime, B. (2000). Subjective and autonomic responses to emotion induction in psychopaths. *L'Encéphale*, 26, 45–51.
- Pham, T. H., & Saloppé, X. (2010). PCL-R psychopathy and its relation to DSM Axis I and II disorders in a sample of male forensic patients in a Belgian security hospital. International Journal of Forensic Mental Health, 9(3), 205–214.
- Pham, T. H., & Saloppé, X. (2013). Influence of psychopathy on self-perceived quality of life in forensic patients: A cohort study in Belgium. *Journal of Foren*sic Psychiatry and Psychology, 24, 31–47.
- Pham, T. H., Vanderstukken, O., Philippot, P., & Vanderlinden, M. (2003). Selective attention and executive functions deficits among criminal psychopaths. Aggressive Behavior, 29, 393–405.
- Poy, R., Segarra, P., Esteller, À., López, R., & Moltó, J. (2014). FFM description of the triarchic conceptualization of psychopathy in men and women. *Psychological Assessment*, 26(1), 69–76.
- Poythress, N. G., Dembo, R., Wareham, J., & Greenbaum, P. E. (2006). Construct validity of the Youth Psychopathic Traits Inventory (YPI) and the Antisocial Process Screening Device (APSD) with justiceinvolved adolescents. *Criminal Justice and Behavior*, 33(1), 26–55.
- Price, S. D., Salekin, R. T., Klinger, M. R., & Barker, E. D. (2013). Psychopathy and depression as predictors of psychosocial difficulties in a sample of court evaluated adolescents. *Personality Disorders: Theory*, *Research, and Treatment*, 4(3), 261–269.
- Radin, P. (1972). The trickster: A study in American Indian mythology. New York: Schocken Books.
- Raine, A. (1997). Antisocial behavior and psychophysiology: A biosocial perspective and a prefrontal dysfunction hypothesis. In D. Stoff, J. Breiling, & J. Maser (Eds.), Handbook of antisocial behavior (pp. 289–304). New York: Wiley.
- Rasmussen, K., Storsaeter, O., & Levander, S. (1999). Personality disorders, psychopathy, and crime in a Norwegian prison population. *International Journal* of Law and Psychiatry, 22, 91–97.
- Rice, M. E., & Harris, G. T. (1995). Psychopathy, schizophrenia, alcohol abuse, and violent recidivism. *International Journal of Law and Psychiatry*, 18, 333–342.
- Roose, A., Bijttebier, P., Decoene, S., Claes, L., & Frick, P. J. (2010). Assessing the affective features of psychopathy in adolescence: A further validation of the inventory of callous and unemotional traits. Assessment, 17(1), 44–57.

- Roussy, S., & Toupin, J. (2000). Behavioral inhibition deficits in juvenile psychopaths. Aggressive Behavior, 26(6), 413–424.
- Rowe, R., Maughan, B., Moran, P., Ford, T., Briskman, J., & Goodman, R. (2010). The role of callous and unemotional traits in the diagnosis of conduct disorder. *Journal of Child Psychology and Psychiatry*, 51(6), 688–695.
- Salekin, R. T., Leistico, A. M. R., Trobst, K. K., Schrum, C. L., & Lochman, J. E. (2005). Adolescent psychopathy and personality theory—the interpersonal circumplex: Expanding evidence of a nomological net. *Journal of Abnormal Child Psychology*, 33(4), 445–460.
- Salekin, R. T., Neumann, C. S., Leistico, A. R., DiCicco, T. M., & Duros, R. L. (2004). Psychopathy and comorbidity in a young offender sample: Taking a closer look at psychopathy's potential importance over the disruptive behavior disorders. *Journal of Abnormal Psychology*, 113, 416–427.
- Salekin, R., Rogers, R., & Sewell, K. (1996). A review and meta-analysis of the Psychopathy Checklist and Psychopathy Checklist—Revised: Predictive validity of dangerousness. Clinical Psychology: Science and Practice, 3, 203–215.
- Sandvik, A. M., Hansen, A. L., Kristensen, M. V., Johnsen, B. H., Logan, C., & Thornton, D. (2012). Assessment of psychopathy: Inter-correlations between Psychopathy Checklist Revised, Comprehensive Assessment of Psychopathic Personality–Institutional Rating Scale, and Self-Report of Psychopathy Scale– III. International Journal of Forensic Mental Health, 11, 280–288.
- Scerbo, A., Raine, A., O'Brien, M., Chan, C. J., Rhee, C., & Smiley, N. (1990). Reward dominance and passive avoidance learning in adolescent psychopaths. *Journal of Abnormal Child Psychology*, 18, 451–463.
- Schaap, G., Lammers, S., & de Vogel, V. (2009). Risk assessment in female forensic psychiatric patients: A quasi-prospective study into the validity of the HCR-20 and PCL-R. *Journal of Forensic Psychiatry and Psychology*, 20(3), 354–365.
- Schmidt, F., McKinnon, L., Chattha, H. K., & Brownlee, K. (2006). Concurrent and predictive validity of the Psychopathy Checklist: Youth Version across gender and ethnicity. *Psychological Assessment*, 18, 393–401.
- Schmitt, W. A., Brinkley, C. A., & Newman, J. P. (1999). Testing Damasio's somatic marker hypothesis with psychopathic individuals: Risk takers or risk averse? *Journal of Abnormal Psychology*, 108, 538–543.
- Schmitt, W. A., & Newman, J. P. (1999). Are all psychopathic individuals low-anxious? *Journal of Abnormal Psychology*, 108, 353–358.
- Sebastian, C. L., McCrory, E. J., Cecil, C. A., Lockwood, P. L., De Brito, S. A., Fontaine, N. M., et al. (2012). Neural responses to affective and cognitive theory of mind in children with conduct problems and varying levels of callous–unemotional traits. Archives of General Psychiatry, 69(8), 814–822.

- Serin, R. C., Peters, R. D., & Barbaree, H. E. (1990). Predictors of psychopathy and release outcome in a criminal population. *Psychological Assessment*, 2, 419–422.
- Sevecke, K., & Kosson, D. S. (2010). Relations of child and adolescent psychopathy to other forms of psychopathology. In R. T. Salekin & D. R. Lynam (Eds.), Handbook of child and adolescent psychopathy (pp. 284–314). New York: Guilford Press.
- Shariat, S. V., Assadi, S. M., Noroozian, M., Pakravannejad, M., Yahyazadeh, O., Aghayan, S., et al. (2010). Psychopathy in Iran: A cross-cultural study. *Journal* of Personality Disorders, 24(5), 676–691.
- Sharp, C., Van Goozen, S., & Goodyer, I. (2006). Children's subjective emotional reactivity to affective pictures: Gender differences and their antisocial correlates in an unselected sample of 7–11-year-olds. Journal of Child Psychology and Psychiatry, 47(2), 143–150.
- Skeem, J. L., & Cauffman, E. (2003). Views of the downward extension: Comparing the youth version of the Psychopathy Checklist with the Youth Psychopathic Traits Inventory. *Behavioral Sciences and the Law*, 21(6), 737–770.
- Skeem, J. L., Edens, J. F., Camp, J., & Colwell, L. H. (2004). Are there ethnic differences in levels of psychopathy?: A meta-analysis. Law and Human Behavior, 28, 505–527.
- Skeem, J. L., Edens, J. F., Sanford, G. M., & Colwell, L. H. (2003). Psychopathic personality and racial/ethnic differences reconsidered: A reply to Lynn (2002). *Personality and Individual Differences*, 35, 1439–1462.
- Smith, S. S., & Newman, J. P. (1990). Alcohol and drug abuse/dependence disorders in psychopathic and nonpsychopathic criminal offenders. *Journal of Abnormal Psychology*, 99, 430–439.
- Somech, L. Y., & Elizur, Y. (2009). Adherence to honor code mediates the prediction of adolescent boys' conduct problems by callousness and socioeconomic status. *Journal of Clinical Child and Adolescent Psychology*, 38(5), 606–618.
- Stalenheim, E. G., & von Knorring, L. (1996). Psychopathy and Axis I and Axis II psychiatric disorders in a forensic psychiatric population in Sweden. Acta Psychiatrica Scandinavica, 94, 217–223.
- Stevens, D., Charman, T., & Blair, R. J. R. (2001). Recognition of emotion in facial expressions and vocal tones in children with psychopathic tendencies. *Journal of Genetic Psychology*, 162(2), 201–211.
- Stockdale, K. C., Olver, M. E., & Wong, S. C. (2010). The Psychopathy Checklist: Youth Version and adolescent and adult recidivism: Considerations with respect to gender, ethnicity, and age. *Psychological Assessment*, 22(4), 768–781.
- Sullivan, E. A., Abramowitz, C. S., Lopez, M. L., & Kosson, D. S. (2006). Reliability and construct validity of the Psychopathy Checklist—Revised for Latino, European American, and African-American male inmates. *Psychological Assessment*, 18, 382–392.

Sullivan, E. A., & Kosson, D. S. (2006). Ethnic and cul-

tural variations in psychopathy. In C. J. Patrick (Ed.), Handbook of psychopathy (pp. 437–458). New York: Guilford Press.

- Syngelaki, E. M., Fairchild, G., Moore, S. C., Savage, J. C., & van Goozen, S. H. (2013). Affective startle potentiation in juvenile offenders: The role of conduct problems and psychopathic traits. Social Neuroscience, 8(2), 112–121.
- Tackett, J. L., Lahey, B. B., Van Hulle, C., Waldman, I., Krueger, R. F., & Rathouz, P. J. (2013). Common genetic influences on negative emotionality and a general psychopathology factor in childhood and adolescence. *Journal of Abnormal Psychology*, 122(4), 1142–1153.
- Tengstrom, A., Grann, M., Langstrom, N., & Kulgren, G. (2000). Psychopathy (PCL-R) as a predictor of violent recidivism among criminal offenders with schizophrenia. Law and Human Behavior, 24, 45–58.
- Thornquist, M. H., & Zuckerman, M. (1995). Psychopathy, passive-avoidance learning and basic dimensions of personality. *Personality and Individual Differences*, 19, 525–534.
- Tikkanen, R., Auvinen-Lintunen, L., Ducci, F., Sjöberg, R. L., Goldman, D., Tiihonen, J., et al. (2011). Psychopathy, PCL-R, and MAOA genotype as predictors of violent reconvictions. *Psychiatry Research*, 185(3), 382–386.
- Toldson, I. A. (2002). The relationship between race and psychopathy: An evaluation of selected psychometric properties of the Psychopathy Checklist—Revised (PCL-R) for incarcerated African American men. Unpublished doctoral dissertation, Temple University, Philadelphia, PA.
- Urbaniok, F., Endrass, J., Rossegger, A., & Noll, T. (2007). Violent and sexual offences: A validation of the predictive quality of the PCL:SV in Switzerland. *International Journal of Law and Psychiatry*, 30(2), 147–152.
- Vahl, P., Colins, O. F., Lodewijks, H. P., Markus, M. T., Doreleijers, T. A., & Vermeiren, R. R. (2014). Psychopathic-like traits in detained adolescents: Clinical usefulness of self-report. European Child and Adolescent Psychiatry, 23(8), 691–699.
- Vaidyanathan, U., Hall, J. R., Patrick, C. J., & Bernat, E. M. (2011). Clarifying the role of defensive reactivity deficits in psychopathy and antisocial personality using startle reflex methodology. *Journal of Abnormal Psychology*, 120(1), 253–258.
- van Baardewijk, Y., Stegge, H., Andershed, H., Thomaes, S., Scholte, E., & Vermeiren, R. (2008). Measuring psychopathic traits in children through selfreport: The development of the Youth Psychopathic Traits Inventory–Child Version. International Journal of Law and Psychiatry, 31(3), 199–209.
- Van de Vijver, F. J., & Leung, K. (1997). Methods and data analysis for cross-cultural research. Thousand Oaks, CA: SAGE.
- Veen, V. C., Stevens, G. W., Andershed, H., Raaijmakers, Q. A., Doreleijers, T. A., & Vollebergh, W. A.

(2011). Cross-ethnic generalizability of the three-factor model of psychopathy: The Youth Psychopathic Traits Inventory in an incarcerated sample of native Dutch and Moroccan immigrant boys. *International Journal of Law and Psychiatry*, 34, 127–130.

- Verona, E., Patrick, C. J., & Joiner, T. E. (2001). Psychopathy, antisocial personality and suicide risk. *Journal of Abnormal Psychology*, 110, 462–470.
- Verona, E., Sadeh, N., & Javdani, S. (2010). The influences of gender and culture on child and adolescent psychopathy. In R. T. Salekin & D. R. Lynam (Eds.), *Handbook of child and adolescent psychopathy* (pp. 317–342). New York: Guilford Press.
- Verschuere, B., Candel, I., Van Reenen, L., & Korebrits, A. (2012). Validity of the Modified Child Psychopathy Scale for juvenile justice center residents. *Journal* of Psychopathology and Behavioral Assessment, 34(2), 244–252.
- Viding, E., Sebastian, C. L., Dadds, M. R., Lockwood, P. L., Cecil, C. A., De Brito, S. A., et al. (2012). Amygdala response to pre-attentive masked fear in children with conduct problems: The role of callous– unemotional traits. *American Journal of Psychiatry*, 169(10), 1109–1116.
- Vitacco, M. J., Rogers, R., & Neumann, C. S. (2003). The antisocial process screening device an examination of its construct and criterion-related validity. *Assessment*, 10(2), 143–150.
- Vitale, J. E., Newman, J. P., Bates, J. E., Goodnight, J., Dodge, K. A., & Pettit, G. S. (2005). Deficient behavioral inhibition and anomalous selective attention in a community sample of adolescents with psychopathic traits and low-anxiety traits. *Journal of Abnormal Child Psychology*, 33(4), 461–470.
- Vitale, J. E., Smith, S. S., Brinkley, C. A., & Newman, J. P. (2002). The reliability and validity of the Psychopathy Checklist—Revised in a sample of female offenders. Criminal Justice and Behavior, 29, 202–231.
- Walsh, Z. (2013). Psychopathy and criminal violence: The moderating effect of ethnicity. *Law and Human Behavior*, 37(5), 303–311.
- Walsh, Z., Allen, L. C., & Kosson, D. S. (2007). Beyond social deviance: Substance use disorders and the dimensions of psychopathy. *Journal of Personality Disorders*, 21, 273–288.
- Walsh, Z., & Kosson, D. S. (2007). Psychopathy and violent crime: A prospective study of the influence of socioeconomic status and ethnicity. *Law and Human Behavior*, 31, 209–229.
- Walters, G. D. (2012). Psychopathy and crime: Testing the incremental validity of PCL-R-measured psychopathy as a predictor of general and violent recidivism. Law and Human Behavior, 36(5), 404–412.
- Wang, P., Baker, L. A., Gao, Y., Raine, A., & Lozano, D. I. (2012). Psychopathic traits and physiological responses to aversive stimuli in children aged 9–11

years. Journal of Abnormal Child Psychology, 40(5), 759–769.

- Warren, J. L., Burnette, M., South, C. S., Chauhan, P., Bale, R., Friend, R., et al. (2003). Psychopathy in women: Structural modeling and co-morbidity. *International Journal of Law and Psychiatry*, 26, 223–242.
- Watt, B. D., & Brooks, N. S. (2012). Self-report psychopathy in an Australian community sample. Psychiatry, Psychology and Law, 19, 389–401.
- White, S. F., Marsh, A. A., Fowler, K. A., Schechter, J. C., Adalio, C., Pope, K., et al. (2012). Reduced amygdala response in youths with disruptive behavior disorders and psychopathic traits: Decreased emotional response versus increased top-down attention to nonemotional features. American Journal of Psychiatry, 169(7), 750–758.
- Whitman, L. A., Kosson, D. S., & McBride, C. K. (2012). Passive avoidance learning, anxiety, and psychopathic features in a sample of detained youth. Manuscript submitted for publication.
- Widiger, T. A. (2005). Five factor model of personality disorder: Integrating science and practice. *Journal of Research in Personality*, 39(1), 67–83.
- Willemsen, J., Vanheule, S., & Verhaeghe, P. (2011). Psychopathy and lifetime experiences of depression. Criminal Behaviour and Mental Health, 21(4), 279–294.
- Williamson, S., Harpur, T. J., & Hare, R. D. (1991). Abnormal processing of affective words by psychopaths. *Psychophysiology*, 28(3), 260–273.
- Wilson, K., Juodis, M., & Porter, S. (2011). Fear and loathing in psychopaths: A meta-analytic investigation of the facial affect recognition deficit. *Criminal Justice and Behavior*, 38, 659–668.
- Wilson, M. J., Abramowitz, C., Vasilev, G., Bozgunov, K., & Vassileva, J. (2014). Psychopathy in Bulgaria: The cross-cultural generalizability of the Hare Psychopathy Checklist. Journal of Psychopathology and Behavioral Assessment, 36(3), 389–400.
- Windle, M., & Dumenci, L. (1999). The factorial structure and construct validity of the Psychopathy Checklist—Revised (PCL-R) among alcoholic inpatients. *Structural Equation Modeling*, 6, 372–393.
- Wolf, E. J., Miller, M. W., & Brown, T. A. (2011). The structure of personality disorders in individuals with posttraumatic stress disorder. *Personality Disorders: Theory, Research, and Treatment*, 2(4), 261–278.
- Zinbarg, R. E., Barlow, D. H., & Brown, T. A. (1997). Hierarchical structure and general factor saturation of the Anxiety Sensitivity Index: Evidence and implications. *Psychological Assessment*, 9(3), 277–284.
- Žukauskiene, R., Laurinavičius, A., & Česniene, I. (2010). Testing factorial structure and validity of the PCL:SV in Lithuanian prison population. Journal of Psychopathology and Behavioral Assessment, 32, 363–372.

# CHAPTER 23

# Deviance at Its Darkest Serial Murder and Psychopathy

ERIC W. HICKEY BETHANY K. WALTERS LAURA E. DRISLANE ISABELLA M. PALUMBO CHRISTOPHER J. PATRICK

Serial murder is perhaps the most highly sen-sationalized criminal phenomenon of our time due to its rarity and horrific nature. While documented acts of this type date back to at least the early Roman Empire (Ramsland, 2005), societal awareness of serial homicide has escalated steadily since the 1960s, with press coverage of notorious cases such as Edward Gein (Schecter, 1989), Albert DeSalvo (the "Boston Strangler"; Frank, 1966), and Charles Manson (Bugliosi & Gentry, 1974).<sup>1</sup> In addition, a number of published books (e.g., Fox & Levin, 2015; Hickey, 2015; Holmes & Holmes, 2010) provide accounts of historic serial murderers such as Vlad Dragwlya ("The Impaler") of 15th-century Romania, Elizabeth Bathory ("The Blood Countess") of 15thcentury Hungary, and the unknown street assassin of 19th-century London dubbed "Jack the Ripper." Some contemporary perpetrators such as "Killer Clown" John Wayne Gacy, "Campus Killer" Ted Bundy, and "Night Stalker" Richard Ramirez have ascended to celebrity status as a function of media exposure-with "Milwaukee Cannibal" Jeffrey Dahmer listed among People magazine's 100 most intriguing people of the 20th century (Fox & Levin, 2015).

Public fascination with serial murder is reflected in the large number of popular films inspired over the years by cases of this type, including Psycho, American Psycho, The Texas Chainsaw Massacre, and The Silence of the Lambs. Indeed, well over 600 films portraying serial murderers were released during the years 2000–2009, compared to only four in the decade of the 1950s (Hickey, 2015). An increasing number of serial-murder-themed television programs have also appeared, such as CSI, Criminal Minds, Forensic Files, and Hannibal-to name only a few. One intriguing development in fictionalized accounts of recent years has been a shift toward portraying serial murderers as troubled protagonists rather than heartless, unredeemable villains. Illustrative of this paradigm shift is Showtime's Emmy Award winning TV series Dexter, which depicts the eponymous main character as a mission-oriented public servant dedicated to ridding the world of "truly evil" serial killers (i.e., those preving on innocent victims).

Despite this high level of public interest in the phenomenon of serial murder, a great deal of misinformation surrounds this topic, and limited empirical research has been conducted on it. Of particular relevance to this volume, a widely held belief among members of the public and mental health professionals alike is that many, if not most, serial murderers are psychopathic; however, systematic scholarly research addressing this question is scant. With this in mind, our major objectives in this chapter are to challenge prevailing misconceptions regarding the phenomenon of serial murder, and to discuss the relationship between serial murder and psychopathy from the standpoint of clinical features of psychopathy (in particular, as defined in criminal offender samples) and through consideration of well-documented cases of serial murderers presumed by many to be psychopathic.

# The Scope of Serial Murder

"Serial murder" is defined as the killing of two or more victims by a perpetrator or team of perpetrators on occasions separated in time (Fox & Levin, 2015; Hickey, 2015; Morton & Hilts, 2008). Serial killings are rare compared to other types of homicides (Hickey, 2015). Historically, estimates of the number of active serial murderers in the United States have varied widely (Egger, 1998; Fox & Levin, 2015; Holmes & De Burger, 1988; Jenkins, 1988, 1994). According to recent Federal Bureau of Investigation (FBI) estimates, there are approximately 20 serial murderers operating in the United States at any given time (Dimond, 2012). Higher estimates, in the range of 35-50, have been suggested by other sources (Douglas, Burgess, Burgess, & Ressler, 2006; U.S. Department of Justice, cited in Jenkins, 1988). A major reason for this variability is that many perpetrators (and victims) of serial murder are never identified, resulting in estimates that are necessarily speculative (Hickey, 2015). Rates of apprehension of serial murderers by law enforcement personnel within the United States have been estimated at 10-12 per year (Douglas et al., 2006; Fox & Levin, 2015).

Serial murderers are believed to be responsible for the deaths of 1–2% of annual reported homicide victims in the United States over recent years (Hickey, 2015). As with perpetrators, estimates of the number of victims are highly tentative due to the issue of undetected cases. Nevertheless, most experts agree that the number of victims of serial murderers is low in absolute terms relative to the overall U. S. homicide rate of approximately 15,000 per year (FBI, 2012).

Far from being solely an American phenomenon, cases of serial murder have been reported in many countries, including Australia, Brazil, Canada, Germany, India, Italy, Mexico, Poland, Russia, South Africa, Sweden, and the United Kingdom (Ebrite, 2005; Egger, 1998; Hickey, 2015). Following a steep increase in documented cases in the United States and nations of Europe from the 1960s through the 1990s, rates of serial murder in these countries have declined over the past decade, paralleling declines in homicide rates more broadly (Fox & Levin, 2015; Hickey, 2015). However, reported cases of serial murder have continued to increase in non-European countries up through the present (Gorby, 2000; Hickey, 2015).

# Differentiating Serial Killing from Mass Murder

Serial murderers are commonly confused with "mass murderers," defined as individuals who murder four or more victims during a single episode of killing occurring within a confined period of time (Hickey, 2015). Despite some similarities between mass and serial murderers, several notable features distinguish the two types of offenders. First, mass murderers are often quickly arrested or killed, sometimes by their own hand; by contrast, serial murderers, by definition, successfully evade law enforcement long enough after their initial homicide offense to perpetrate at least one other (Hickey, 2015). The nature of the homicidal action also tends to differ. Victims of mass murderers often include family members, either in the context of exclusively domestic homicides, or bifurcated murders-in which family members or other known persons are slain in one location, typically at home, followed by other murders at a separate location (e.g., workplace or school; Hickey, 2015). By contrast, most male serial murderers kill only nonfamilial acquaintances or strangers.

Mass murderers are also far more likely than serial murderers to meet diagnostic criteria for severe mental disorders such as schizophrenia or bipolar disorder, whereas serial murderers more often exhibit personality disorders (most typically antisocial personality), along with paraphilias in many cases (Douglas, Burgess, Burgess, & Ressler, 2013; Duwe, 2004; Hickey, 2015; White-Hamon, 2000). As a function of this, less than 4% of serial murderers claim insanity as a legal defense, and few of these are found to be insane by the court (Hickey, 2015). Additionally, mass murderers appear to kill for different reasons than serial murderers. Relief from stress is cited as a primary motive in many mass homicides, whereas serial murderers often identify sexual gratification as an underlying motive for their crimes (Bartol & Bartol, 2013; Hickey, 2015).

# **Heterogeneity within Serial Murderers**

Although it has been over 25 years since publication of Thomas Harris's (1988) classic novel The Silence of the Lambs, Hannibal Lecter (most prominently portrayed onscreen by Anthony Hopkins in the 1991 film adaptation) remains the dominant prototype of the serial murderer in the minds of many. Despite this well-known stereotype, serial murderers in reality comprise a markedly heterogeneous group of individuals (Walters, Drislane, Patrick, & Hickey, 2015). In contrast with the genius-level IQ exhibited by fictional character Lecter, real-life serial murderers vary in intellectual ability, with some markedly below average and others clearly above, but most falling within the average range (Ebrite, 2005; Hickey, 2015; Morton & Hilts, 2008). Also contrary to public perception, serial murderers are not exclusively European American. Fox and Levin (2015), for example, reported that nearly one-third of 650 documented perpetrators of serial murder in the United States from 1900 to the present time were African American. Furthermore, the proportion of non-European American serial murderers appears to have increased in recent years: Statistics for the years 2004–2011 indicate that approximately half of a total of 146 male serial murderers known to be operating in the United States during this period were African American (Hickey, 2015).

Another prevalent misconception is that serial murderers tend to travel long distances in committing their homicides. In fact, approximately 74% operate locally and kill their victims within a circumscribed geographic area (Hickey, 2015). However, a portion of serial murderers are in fact highly mobile. As an indication of this, the FBI's Highway Serial Killing Initiative was able to implicate over 275 suspects, many employed as longhaul truck drivers, in the serial murders of over 500 victims between 2009 and 2011 (FBI, 2011).

The main characteristic that serial murderers have in common is that most are men. For example, over the period from 2004 to 2014, 92% of serial murderers known to be operating in the United States were male (Fox & Levin, 2015; Hickey, 2015). Those serial murderers who are female tend to show distinct differences from their male counterparts. Most notably, females are more likely to kill as part of a team than are male serial murderers (Hickey, 2015). (Team killers account for approximately 20% of documented serial murder cases over the past decade.) Female serial murderers are also more likely to kill their spouses or family members, whereas male serial murderers (as noted earlier) more frequently target nonfamilial persons (Fox & Levin, 2015; Godwin, 2008; Hickey, 2015). In particular, prostitutes are overrepresented as victims of male serial murderers, with the proportion of victims identified as prostitutes increasing from 17% between 1970 and 1989 to 33% since 1990 (Quinet, 2011). Additionally, females are more likely than males to use covert methods of killing (e.g., poison or lethal doses of prescription medications), and more often kill in the context of health care positions than their male counterparts (Hickey, 2015; Yorker et al., 2006).

In contrast with other homicidal offenders, serial murderers typically commence killing at older ages, beginning in their early 30s on average (Fox & Levin, 2015; Godwin, 2008; Hickey, 2015). With respect to victim numbers, available data indicate that U.S. serial murderers in recent times have fewer victims than in the past (i.e., approximately four on average, according to Hickey, 2015, for perpetrators operating during the 7-year period preceding 2015).

Although the foregoing information regarding characteristics of serial murderers is derived from cases within the United States, serial murder is a global phenomenon, and notable cultural and regional differences in perpetrator characteristics have been identified. For example, Gorby (2000) reported that outside the United States, women account for approximately 25% of documented serial murderers, compared to only about 8% among recent serial murderers within the United States according to Hickey (2015). Elsewhere, Ulrich (2000) reported that, in contrast with American serial murderers, who most commonly identify sexual gratification as a motive for killing (Hickey, 2015), perpetrators from outside the United States are more likely to cite nonsexual motives, such as financial gain.

# Empirical Findings on Serial Murder and Psychopathy

Perhaps the most pervasive (mis)perception about serial murder is that all serial murderers are "psychopaths." In addition to laypeople, many psychologists in the clinical-forensic area view serial murderers as being highly psychopathic individuals. Indeed, Logan and Hare (2008) estimated that 90% of serial killers would be classifiable as psychopathic ( $\geq$  30) according to criteria of the Psychopathy Checklist—Revised (PCL-R; Hare, 2003). The tendency to conflate serial murder with psychopathy is undoubtedly linked to the brutal nature of this form of violent victimization: Surely an individual who repeatedly takes the lives of innocent victims-in the process engaging in vicious acts such as rape, torture, cannibalism, or necrophilia-must be devoid of any capacity for empathy, remorse, or deep emotions. Indeed, Mc-Cord and McCord (1964) characterized lack of social connectedness or concern ("lovelessness") and absence of remorse ("guiltlessness") as the core attributes underlying psychopathy. Modern conceptions of psychopathy in youth and adults likewise place strong emphasis on callous and unemotional traits in defining the condition (Frick & Marsee, Chapter 19, and Lynam, Miller, & Derefinko, Chapter 11, this volume). However, while serial murderers appear to exemplify the "coldheartedness" features of psychopathy, it is unclear to what extent they also generally exhibit the impulsivedisinhibitory and bold-fearless elements (Patrick, Fowles, & Krueger, 2009), or the life-course-persistent antisocial behavior also considered characteristic of the disorder (Hare, 2003). This is a question that needs to be addressed empirically in order to clarify the intersection between psychopathy and serial murder.

Before reviewing available research pertaining to the relationship between psychopathy and serial murder, it is important to note some of the major limitations of the current state of the literature. To begin with, due to the (fortunately) rare occurrence of serial murder, the limited availability of research subjects and relevant data poses a significant challenge to systematic research. Related to this, reported prevalence figures for perpetrators and victims (as noted earlier) are likely imprecise because an unknown proportion of victims of serial murder are either not found or go unidentified (Quinet, 2007), and there are some serial murderers who successfully evade law enforcement and are never apprehended—such as the perpetrator labeled the "Zodiac Killer," who claimed the lives of five known victims in northern California during the late 1960s and early 1970s. Furthermore, some murderers apprehended for single homicides may not be identified as repeat offenders due to a failure to link related homicide cases to the same perpetrator (Douglas et al., 2013; Fox & Levin, 2015). Owing to these factors, documented cases may not be representative of all individuals who have engaged in serial murder. In addition to questionable representativeness, another problem with the literature in this area is that many published studies have not employed rigorous scientific methodology or undergone the process of peer review. Indeed, much of the existing published research on serial murder relies on individual case studies, which limits the generalizability of findings to cases as a whole.

Despite these limitations, a number of consistent themes regarding characteristics of serial murderers have been identified in the existing scientific literature. At the same time, there is a notable paucity of credible empirical work specifically evaluating the relationship between psychopathy and serial murder. Thus, we begin by reviewing the evidence for a relationship between psychopathy and violence more broadly, as a basis for hypotheses concerning the role of psychopathic traits in serial murder, and then review the small number of studies that have addressed this topic directly.

# **Psychopathy and Violence**

As reviewed in other chapters of this volume (Douglas, Vincent, & Edens, Chapter 28; Knight & Guay, Chapter 27; Porter, Woodworth, & Black, Chapter 25), clear evidence exists for a relationship between psychopathy and violent behavior. For example, in an early study of incarcerated offenders, Hare and Jutai (1983) reported that offenders meeting criteria for psychopathy had twice as many recorded charges for violent crimes as nonpsychopathic offenders. Subsequent to this, Porter, Birt, and Boer (2001) reported similar findings in a sample of 317 Canadian prisoners, where, again, psychopathic offenders were found to have committed nearly double the number of crimes as nonpsychopathic offenders.

In addition to violent behavior broadly speaking, psychopathy is also associated with specific types of violent crimes, including murder and sexual assault. In the previously noted study by Porter and colleagues (2001), and as detailed further in Chapter 25 (this volume), higher scores on the affective–interpersonal (Factor 1) features of psychopathy as assessed by the PCL-R have been found to distinguish psychopathic murderers from nonpsychopathic murderers. High levels of psychopathy have also been observed among sexual homicide offenders. For example, Porter, Woodworth, Earle, Drugge, and Boer (2003) reported that 52.6% of sexual murderers (20 out of 38) from a larger sample of homicide offenders scored at or above the PCL-R cutoff score of 30 for psychopathy. Furthermore, psychopathic traits in this study were associated with a more severe pattern of violent sexual behavior, as 82.4% of the high-psychopathy sexual murderers were found to have committed sadistic and unnecessary violence against their victims, compared to only 52.6% of low-psychopathy sexual murderers.

Additionally, psychopathy has been shown to be associated with higher rates of proactive (instrumental) aggression. For example, in a sample of 125 Canadian offenders, Woodworth and Porter (2002) reported that nearly all psychopathic killers (93.3%) committed their murders for instrumental rather than reactive reasons, compared with only 48.4% of nonpsychopathic murderers. Along similar lines, the literature on psychopathy in childhood and adolescence highlights a robust, selective association between the callous–unemotional traits that characterize psychopathy in this age group and proactive forms of aggression (Frick & Marsee, Chapter 19, this volume; Frick, Ray, Thornton, & Kahn, 2014).

# **Psychopathy and Serial Murder**

Serial murder is commonly instrumental in nature and often contains a sexual component (Douglas et al., 2013; Fox & Levin, 2015; Hickey, 2015; Holmes & Holmes, 2010); thus, it stands to reason (as suggested by Porter et al., Chapter 25, this volume) that serial murder and psychopathy might be systematically related. In this regard, Morton and Hilts (2008, p. 14) cited a statement by the FBI noting that "serial murderers may possess some or many of the traits consistent with psychopathy" and called for further empirical research on this topic. O'Toole (2007) reported that research on the relationship between psychopathic traits and evidence left at crime scenes of serial murders was being undertaken by the Behavioral Analysis Unit of the FBI itself.

The published literature on psychopathy and serial murder is limited, and problematic in critical ways. One key issue concerns the conflation of psychopathy with antisocial personality disorder (ASPD) by some authors. Dobbert (2009), for example, reviewed case information for 22 serial murderers and concluded that 18 of these would be classified as "psychopaths." However, Dobbert characterized psychopathy as differing only in degree from ASPD, stating that "psychopathy, sociopathy, and antisocial personality disorder represent the same set of symptoms and behaviors, but sit on a continuum from less to more severe" (p. 5). Due to important differences between psychopathy and ASPD highlighted by other authors (e.g., Hare, 2003; Hare, Hart, & Harpur, 1991) and the much higher base rate of the latter (see Hare, Neumann, & Mokros, Chapter 3, this volume), the subset of serial murderers in Dobbert's study who would meet PCL-R criteria for psychopathy is likely to differ from the portion who would be diagnosed with ASPD. Nevertheless, even among authors who have distinguished between psychopathy and ASPD, many perpetrators of serial murder have been identified as psychopathic. For example, LaBrode (2007) characterized well-known serial killers Edward Gein, John Wayne Gacy, Edmund Kemper, Ted Bundy, Jeffrey Dahmer, Gary Ridgway (the Green River killer), and Dennis Rader (the BTK killer) as "psychopaths." However, LaBrode did not specify whether his designations of these individuals as psychopathic were based on general impressions or on use of a formal diagnostic method (i.e., the PCL-R, or some other psychopathy rating system).

Some case reports have been published that characterize individual serial murderers in terms of psychopathic traits, either informally or using the PCL-R. For example, Arrigo and Griffin (2004) described Aileen Wuornos as possessing a number of psychopathic features including impulsivity, hostility, and an inability to form close attachments. In another case study, Silva, Ferrari, and Leong (2002) used PCL-R criteria to assess for the presence of psychopathic tendencies in serial murderer Jeffrey Dahmer. These authors assigned Dahmer a total score of 22 (out of a possible 40) on the PCL-R, noting that while he possessed some psychopathic characteristics, he did not meet the diagnostic threshold for psychopathy (i.e., total PCL-R score of at least 30).

A small number of other studies have assessed for the presence of diagnostic symptoms of psychopathy in samples of serial murder cases, as opposed to individual cases. Dudek (2001) evaluated psychopathic features in 26 serial murderers and 49 single homicide offenders. Psychopathy in each case was assessed using the PCL-R, scored on the basis of information from criminal investigative files provided by law enforcement agencies. Ratings were performed by two FBI Special Agents trained in use of the PCL-R by the study author (Dudek), a doctoral student. Findings from this study indicated that serial murderers scored higher on PCL-R total and Factor 1 scores (with total scores averaging approximately 31/40) than did single homicide offenders (who averaged approximately 25/40). There were no significant differences between the groups for Factor 2, which encompasses the Impulsive Lifestyle and Antisocial Behavior facets of the PCL-R.

Some limitations of Dudek's (2001) study warrant mention. First, training in the use of the PCL-R was provided to the FBI raters by the study author, whose own instructional background and rating experience with the instrument was not clearly documented. The training consisted of listening to instructional audiotapes for the PCL-R and reviewing printed descriptive materials; the trainees did not complete expert-rated criterion cases to establish the validity of their ratings. Interrater reliability was assessed only for a small number of cases, and considerable disagreement was evident for individual items of the PCL-R in these cases. Despite this, the remaining cases were each scored by only a single rater. Additionally, this study was published only in dissertation manuscript form (by the National Criminal Justice Reference Service) and therefore did not undergo the process of peer review. Consequently, the results of this study must be interpreted with caution and viewed only as preliminary evidence. Despite these limitations, Dudek's finding that serial murderers exhibited more features of psychopathy than single homicide offenders appears consistent with prior work suggesting a relationship between serial murder and psychopathic tendencies.

In a more recent study, Norris (2011) examined psychopathic symptoms as a function of gender in six serial murder cases selected for their notoriety and reputed callousness: Ted Bundy, Richard Ramirez, Dennis Rader, Erzebet (Elizabeth) Bathory, Jane Toppan, and Aileen Wuornos. Psychopathy was again assessed using the PCL-R, and items were rated based on information from publicly available biographies for each subject. Subjects were considered psychopathic if they scored at or above 30 on the PCL-R. Norris concluded that "while all of the serial murderers chosen for this study outwardly appeared to fit the profile of a psychopath, only Ted Bundy scored high enough to be diagnosed as such" (p. 160). Results also indicated that the three male murderers in the study

sample scored higher on the PCL-R as a whole (M = 24.3) than did the three female perpetrators (M = 19). Males also scored higher than females on Factor 1 of the PCL-R (M's = 14 and 10, respectively, out of 16), but did not differ from females on Factor 2. Major limitations of this study include the fact that it focused on only a small set of cases, with diagnostic ratings performed by a single assessor not formally trained in scoring of the PCL-R. In addition, this study (like Dudek's [2001]) is an unpublished thesis project that did not undergo the scrutiny of peer review. Nonetheless, the study is valuable in that it provides preliminary evidence that some serial murderers noted for the extent and brutality of their crimes may, contrary to widespread belief, not be clinically psychopathic.

The most widely cited study on the relationship between psychopathy and serial murder is one by Stone (2001) that used information in the form of "full-length biographies" (listed in an appendix to the article) to rate 99 serial sexual murderers on the PCL-R. Stone concluded that 91% of his sample met PCL-R criteria for psychopathy (i.e., total score  $\geq$  30). These findings contrast clearly with those of Norris (2011), who rated only one of six selected cases as psychopathic. Although published in a peer-reviewed journal, the Stone study is nonetheless limited in certain key respects. The article notes that PCL-R ratings were performed by Stone himself, but no information is provided regarding the author's training, experience, or reliability in such assessments. No details are provided regarding the adequacy of biographical information for scoring items of the PCL-R in each case. The article includes only a brief summary of aggregate findings (i.e., proportion of sample diagnosed as psychopathic), with specific mention of PCL-R scores for two cases only. No information is provided regarding scores on the factors or facets of the PCL-R (cf. Hare, 2003).

In summary, research to date on the relationship between psychopathy and serial murder suffers from notable limitations and has yielded mixed results. Some authors have reported very high rates of psychopathy as defined by the PCL-R among serial murderers (Dudek, 2001; Stone, 2001) whereas others have reported only modest rates (Norris, 2011). Due to the paucity of work on this topic and the methodological weaknesses of existing studies, there remains a need for systematic empirical research on the intersection between PCL-R-defined psychopathy and serial murder. The limitations of existing studies point to some clear directions for improvement:

- Future studies should focus on large samples of well-documented cases, with a defensible rationale provided for inclusion versus exclusion.
- 2. Sources of biographical information used to score the PCL-R items should be clearly identified, with case-by-case notation of any items left unscored for lack of information.
- 3. Diagnostic assessments should be performed by multiple raters trained in use of the PCL-R, working separately to assign item scores based on available case facts.
- 4. Items should be scored individually, with close adherence to criteria specified in the PCL-R manual, to avoid halo effects based on general impressions.
- 5. A consistent, defensible approach to resolving differences in scoring of particular items across raters should be used—such as a consensusbased approach that arbitrates among alternative scores through discussion of all facts considered relevant.
- 6. Investigators undertaking studies of this type should seek to publish their results in peerreviewed journals, documenting methods and findings in sufficient detail to permit replication studies.

With these criteria in mind, we describe in the next, final section initial efforts we have made along these lines to further advance our understanding of the degree to which known perpetrators of serial murder exhibit characteristics of psychopathy, as defined by the PCL-R.

# Preliminary Findings from a New Study of Psychopathy and Serial Murder

We have undertaken a new study in which we are using the item criteria from Hare's (2003) PCL-R to assess for psychopathic features of serial murderers in well-documented cases. Our major aim in this study is to clarify the extent to which perpetrators of serial homicides meet full clinical criteria for psychopathy according to this wellvalidated measure designed for use with criminal offenders. In the process, we hope to gain insight into personal characteristics contributing to engagement in serial murder—in particular, whether dispositional tendencies associated with psychopathy increase the likelihood that individuals will venture down this dark path. In addition, we anticipate that this work will contribute to ongoing debates (see Patrick, Chapter 1, and Lilienfeld, Watts, Smith, & Latzman, Chapter 8, this volume) regarding the nature and boundaries of the psychopathy construct and how best to assess it in different contexts.

# Study Description and Preliminary Results

The procedures we are using for this study follow the research recommendations listed at the close of the preceding section. The target sample for the project consists of convicted male and female serial murderers from the United States and other countries of the world. For a case to be included, sufficient relevant information must be available from published books, articles, Internet documents and videos, and other sources, for the perpetrator to be rated on the items of the PCL-R according to the criteria specified in the published manual (Hare, 2003). Each case is rated by multiple diagnosticians trained in use of the PCL-R. who have demonstrated agreement with experts in their scoring of separate training cases. Cases are rated independently by each diagnostician, with disagreements among raters for particular PCL-R items resolved through a consensus process involving joint re-review and discussion of item-relevant information from available case documents.

As a point of reference for discussing initial findings, Table 23.1 presents summary data for five well-known serial murderers included in this ongoing study: Theodore ("Ted") Bundy, John Gacy, Edmund Kemper, Jeffrey Dahmer, and Gary Ridgway. Each of these cases was rated separately by four of the authors of the current chapter (Hickey, Walters, Drislane, and Patrick), using information from publicly accessible sources as noted earlier. Agreement across raters for these cases was very high. Table 23.1 shows final consensus-based ratings for the PCL-R as a whole, along with scores for the two PCL-R factors and their narrower constituent facets (Interpersonal Style, Affective Deficits, Impulsive Lifestyle, Antisocial Behavior). Consistent with the idea of a systematic relationship between serial murder and psychopathy, all five of these perpetrators exhibited salient psychopathic symptoms. However, contrary to the view that most serial killers (including these specific ones; LaBrode, 2007) are clinically psychopathic, only one of the five (Ted Bundy) exceeded the PCL-R cutoff score of 30 out of 40 points required for a diagnosis of psychopathy (Hare, 2003). Con-

Name	Total	Factor 1	Factor 2	Interpersonal	Affective	Impulsive	Antisocial
Bundy	34	16	15.5	8	8	8	7.5
Gacy	27	16	9	8	8	3	6
Kemper	26	13	11	5	8	4	7
Dahmer	23	9	12	3	6	8	4
Ridgway	19	11	4.5	4	7	2	2.5

TABLE 23.1. Consensus PCL-R Ratings for Five Well-Known Serial Murderers

*Note.* Total = score (out of 40) on all PCL-R items; Factor 1 = score (out of 16) on affective–interpersonal items; Factor 2 = score (out of 20) on impulsive–antisocial items; Interpersonal = score (out of 8) for interpersonal style items (1, 2, 4, and 5); Affective = score (out of 8) on affective deficits items (6, 7, 8, and 16); Impulsive = score (out of 10) on impulsive–irresponsible lifestyle items (3, 9, 13, 14, 15); Antisocial = score (out of 10) on antisocial behavior items (10, 12, 18, 19, 20).

sidering that the standard error of measurement for the PCL-R is 3 score points (Hare, 2003), it could be argued that John Gacy, with a score of 27, also qualifies as psychopathic. However, scores for the other three cases fall below even this relaxed threshold.

Along with overall PCL-R scores, the results for PCL-R factor and facet scores are interesting to consider. Bundy and Gacy each scored the maximum number of points on Factor 1 of the PCL-R and its Interpersonal and Affective facets. Kemper and Ridgway also scored quite high on this factor, but each was lacking in certain Factor 1 featuresones associated with the PCL-R's Interpersonal facet in particular. Additionally, Ridgway scored very low on Factor 2, reflecting the postchildhood onset of his criminal deviance and the extreme compartmentalization of his homicidal behavior; when not engaged in hunting and victimization of prostitutes and young runaways as an adult, Ridgway worked steadily as an automotive painter, was married for lengthy intervals, and participated regularly in church-related activities.

The results for Bundy, Gacy, and Kemper are of particular interest because these individuals were among the 36 perpetrators interviewed by agents from the FBI's Behavioral Analysis Unit to establish procedures for profiling of serial murder cases (Ressler, Burgess, & Douglas, 1988). Bundy and Gacy were identified as prototypes of the "organized" type of offender, who exhibits premeditation in commission of crimes, good intelligence, social competence, and strong psychopathic tendencies. Their very high scores on the affectiveinterpersonal features considered most central to the diagnosis of psychopathy (Hare et al., 1991; Harpur, Hare, & Hakstian, 1989) may explain why these individuals have so often been cited as textbook examples of psychopaths. However, Bundy's consensus rating of 34 (discussed further in the next subsection) falls well below the maximum PCL-R score of 40, and as noted earlier, Gacy's score falls below the cutoff for psychopathy, owing to his modest score on PCL-R Factor 2. Kemper was characterized by Ressler and colleagues (1988; see also Ressler, 1992) as predominantly organized in his pattern of homicidal behavior, although he engaged in mutilation of bodies after death-a behavior more typical of disorganized serial murderers—and he has frequently been described as psychopathic in published writings (e.g., Bonn, 2014; LaBrode, 2007). However, Kemper scores more than one standard error unit below the cutoff for a PCL-R diagnosis of psychopathy because, while his Factor 1 score is quite high, his Factor 2 score is only moderate relative to offender norms (i.e., falling slightly below the mean of 11.6 for incarcerated adult males; Hare, 2003) and he was assigned a score of zero on one of the two PCL-R items not included in either PCL-R factor (i.e., item 17, "many short-term marital relationships").

Before considering the implications of these preliminary findings for our understanding of the relationship between serial murder and psychopathy, we provide a more detailed comparative analysis, in the next subsection, of psychopathic features exhibited by Ted Bundy relative to those exhibited by serial murderer Jeffrey Dahmer.

#### Detailed Comparison of the Bundy and Dahmer Cases

Ted Bundy is probably the best-known serial murderer in America. People with whom he came in contact described him as an attractive "boy next door" type—good-looking, well spoken, genial, and socially engaging. He ultimately confessed to killing 30 females in seven states between 1974 and 1978, and authorities suspect he committed other murders besides these; his youngest known victim was 12 years old. Most victims were abducted and raped or otherwise sexually assaulted before their deaths. While perpetrating his homicidal acts, Bundy lived a transient antisocial lifestyle, traveling from place to place and shoplifting or committing burglaries to obtain money and goods rather than working. He escaped twice from custody prior to his final apprehension in 1978, continuing his killings during the periods he spent at large. Bundy was notably cocky and manipulative: He played games with police investigators, admitting at first and then denying he was a killer, and he opted to serve as his own attorney at his murder trial. During his time as a prisoner on death row up through the time of his execution, Bundy's charisma gained him a large cadre of female fans who competed to marry him (Michaud, Aynesworth, & Bundy, 2000; Nelson, 1994).

Jeffrey Dahmer is another widely known American serial killer. Obsessed by sexualized thoughts and images of death, Dahmer murdered a total of 17 male victims, many of them in his bachelor apartment in Milwaukee, and engaged in a range of postmortem acts, including necrophilia, dismemberment, cannibalism, and preservation of skulls and body parts. Members of Dahmer's family and others who knew him were shocked to learn of his murderous obsessions and behavior. To them, Jeffrey was a shy, introverted, and socially awkward person whose main shortcomings were a lack of ambition and a tendency to drink to excess (L. Dahmer, 1994; Davis, 1991). Dahmer admitted to the murders after being arrested and apologized publicly for his crimes; he was found legally sane and sentenced to life in prison, where he was subsequently killed by a fellow inmate.

While Bundy and Dahmer are similar in having perpetrated multiple savage and depraved crimes, they differ in a number of notable ways when it comes to diagnostic features of psychopathy. We consider these from the standpoint of distinct symptomatic facets assessed by the PCL-R.

The PCL-R facet on which Bundy and Dahmer were most dissimilar was the Interpersonal facet, which encompasses four items: glibness/superficial charm, grandiosity, pathological lying, and manipulativeness. A score of 2 is assigned for the first of these items to individuals who present as loquacious, verbally facile, personable and entertaining, and ostensibly knowledgeable in various subject areas (Hare, 2003). Bundy epitomized these qualities: He was described as charming by many who knew him, including his trial attorney, who wrote at length about his interpersonal charisma (Nelson, 1994). He appeared comfortable and outgoing in social situations and lacked apprehension about speaking in public-even when it came to addressing the court in his murder trial (Michaud et al., 2000; Nelson, 1994). He laughed and joked with the press and took control of the interviews he gave. Accordingly, Bundy was assigned a score of 2 for this item. By contrast, Dahmer received a score of 0. He was not outgoing and could be considered an introvert. He did not exhibit a "gift of gab" and was not talkative by nature. He appeared uncomfortable and awkward in social situations from an early point in his life, often avoiding interactions with others. He was considered "weird" by his classmates in school, both because of his social ineptness and his occasional efforts to attract attention in peculiar ways. As an adult, he was generally a loner who kept to himself when not on the hunt for victims. In interview situations, he appeared "wooden" rather than charming-speaking clearly, but prosaically, and without much expression.

Bundy and Dahmer also received contrasting scores of 2 and 0, respectively, on item 2 of the Interpersonal facet, grandiose sense of self-worth. Bundy was cocky and self-assured, projecting an image of savoir faire. He viewed himself as highly intelligent and believed he could outsmart others. Examples of this include his decision to defend himself because he considered his attorneys incompetent, and his belief that he could avoid or forestall his upcoming execution by providing new information to authorities about unsolved murders (Michaud et al., 2000; Nelson, 1994). Dahmer, on the other hand, was insecure, lacking in confidence, and low in self-esteem. He was viewed by people who knew him as depressed and unmotivated (Dahmer, 1994; Davis, 1991). In interview situations, he presented as modest and self-effacing rather than as cocky and self-aggrandizing.

Item 4 of the PCL-R's Interpersonal facet, pathological lying, involves pervasive use of deception in various domains of life, proneness to fabricate stories even when it is unnecessary to do so, use of aliases, and ability to recover effectively when caught lying (Hare, 2003). Bundy received a score of 2 on this item, as he showed a pervasive inclination to lie to people across many different situations—including lawyers assigned to defend him and authors enlisted to write his biography (Michaud et al., 2000; Nelson, 1994). For Bundy, truth and lies were interchangeable, and rationalization was indistinguishable from reason. Dahmer also exhibited clear tendencies toward deception, but his lying was largely directed toward concealing or covering up his criminal acts. He confided in his brother while growing up and was viewed by him as generally honest. He was less communicative with his parents as a youth, but was not known for lying (L. Dahmer, 1994). As an adolescent and adult, he often withheld information to avoid conflict or trouble and lied to gain the trust of his victims, but he did not lie for the sake of lying. Thus, his lying was predominantly instrumental. For these reasons, Dahmer received a score of 1 for this item. However, given his instrumental use of lies and his effectiveness in seducing and manipulating his victims (and in some notable instances, law enforcement personnel dispatched to investigate incidents in which he was involved; Davis, 1991), Dahmer was assigned a score of 2 on item 5 of the Interpersonal facet, conning/manipulative, which pertains to the use of trickery or deception to gain specific desired outcomes. Bundy, renowned for his verbal persuasiveness and conning ability, also received a clear score of 2 on this item.

Along with scoring differently on the Interpersonal facet, Bundy and Dahmer also differed clearly on the Antisocial Behavior facet. Bundy received a prorated score of 7.5 on this facet (item 12, early behavior problems, was omitted due to a lack of pertinent information in existing sources), whereas Dahmer was assigned a score of 4. The main source of this difference was in ratings for items 18 and 20 of this facet, pertaining to juvenile delinquency and criminal versatility. Dahmer had no charges or convictions at or before age 17, whereas Bundy was arrested for theft in high school, resulting in scores of 0 and 1, respectively, on item 18. Regarding item 20, Dahmer had official charges in only three categories (homicide, sexual offense, drunk/disorderly), yielding a score of 0, whereas Bundy had official charges in multiple categories (including homicide, kidnapping, sexual assault, theft, failure to stop for police, and prison escape), resulting in a score of 2.

The PCL-R facet on which these two offenders scored most similarly was the Impulsive–Irresponsible facet, with each receiving 8 out of 10 possible points. Both showed clear evidence of a need for stimulation and lack of realistic long-term goals, being assigned scores of 2 for these items (items 3 and 13, respectively). Each showed some tendency toward parasitism (score = 1 on item 9), Bundy in terms of supporting himself through burglary and theft, and Dahmer in terms of relying on family at times for lodging and financial support. Tendencies toward impulsiveness and irresponsibility (items 14 and 15) were also evident in each of these cases.

The other PCL-R facet on which these two offenders scored quite similarly was the Affective facet, encompassing lack of remorse, deficient empathy, shallow affect, and failure to accept responsibility for actions. As we discuss in the next subsection, it is this facet of psychopathy that may relate most closely to the phenomenon of serial murder, in terms of the phenotypic tendencies it encompasses-and potentially also the distinct etiological factors that contribute to it. Bundy received a score of 8 on this facet, Dahmer a score of 6. One source of the two-point difference in their scores was PCL-R item 6, lack of remorse or guilt; Bundy's score for this item was 2, Dahmer's was 1. Bundy claimed remorse for his actions at times in public but showed negligible regret in discussions with authorities, made no effort to apologize or atone for his crimes, and even stated on some occasions that his victims deserved to die. On this basis, he scored a 2 on this item. By contrast, Dahmer-though claiming he could not control his impulses to kill—readily admitted knowing his actions were wrong, and following his arrest and again in court apologized for what he had done and said he believed he should never be let out of prison (Dahmer, 1994; Davis, 1991). On the other hand, Dahmer's repeated perpetration of similar offenses over several years' time provides evidence for deficient remorse according to PCL-R scoring criteria. Given this mixed evidence, Dahmer was assigned a score of 1 for this item.

The other source of the difference in scores on the Affective facet of the PCL-R was item 16, failure to accept responsibility for actions. Bundy scored a 2 on this item because he generally refused to accept blame for negative behaviors on his part, denied having committed the crimes for which he was charged from the time of his arrest until just before his execution more than a decade later, and then in his last interview attributed his murderous acts to pornography exposure and alcohol use (Dobson, Bundy, & Focus on the Family Films, 1989). By contrast, Dahmer readily admitted responsibility for the murders he committed at the time of his arrest and openly disclosed details of his actions to case investigators. In addition to killing the victims discovered by police at his place of residence, Dahmer also admitted to other murders, one of them committed many years before that would have otherwise gone undetected. At earlier times in his life, however, Dahmer minimized his actions and sought to evade responsibility when confronted about wrongful acts (e.g., when his father questioned him about having stolen a department store mannequin; Dahmer, 1994). Given these mixed indications, Dahmer was assigned a score of 1 on this item.

Each of these offenders was assigned a score of 2 on item 8 of the Affective facet, pertaining to callousness and lack of empathy toward others, including victims. Both Bundy and Dahmer showed a profound disregard for the feelings and welfare of their victims, achieving sexual gratification repeatedly through acts of murder and physical defilement. The criteria for item 7 of this facet, shallow affect, refer to a failure to exhibit a normal range of emotional expression, with affective displays (to the extent they occur) appearing shallow and short-lived (Hare, 2003). Bundy and Dahmer each received a score of 2 on this item; however, their presentations in this regard were quite different and worth noting. Bundy presented as garrulous and animated but extremely shallow; he exhibited a notable air of nonchalance, did not connect closely with people, and only established relationships with others to gain things he wanted (Michaud et al., 2000; Nelson, 1994). Dahmer also exhibited a limited range of affect, but he presented as socially reserved, emotionally distant, and dysphoric rather than superficially demonstrative.

We acknowledge that these findings are preliminary and that no firm conclusions can be drawn based on individual cases or small samples of unknown representativeness. However, our comparative analysis of PCL-R scores for the Bundy and Dahmer cases, considered in relation to the data for other cases in Table 23.1, has some interesting implications for our understanding of serial murder and psychopathy, and how the two conditions interface. We consider these implications next.

## Conceptualizing the Relationship between Serial Murder and Psychopathy

As discussed earlier, Bundy and Dahmer resemble each other most on the Impulsive and Affective items of the PCL-R and differ most on the Interpersonal and Antisocial items. Examining the scores for other cases in Table 23.1 (Gacy, Kemper, and Ridgway), it can be seen that the major commonality among them is the elevation on the Affective facet of the PCL-R: Gacy, Kemper, and Ridgway were even more similar to Bundy on this facet than was Dahmer. By contrast, considerable variability is evident in the scores for the other PCL-R facets across cases: Gacy, Kemper, and Ridgway each scored quite low on the Impulsive facet compared to Bundy and Dahmer; Gacy scored as high as Bundy on the Interpersonal facet, whereas the others scored noticeably lower; and Ridgway scored even lower than Dahmer on the Antisocial facet, with Kemper and Gacy receiving scores more similar to Bundy.

Our emerging perspective from these and other cases we have rated to date is that it is the affective features of PCL-R psychopathy that are most consistently present in serial murderers. One reason for this is the nature of the acts perpetrated by serial murderers, involving repeated fatal victimization of others. The scoring criteria for item 6 of the PCL-R indicate that lack of remorse can be demonstrated by "repeatedly engaging in activities that are clearly harmful to others" (Hare, 2003, p. 38). Given this, a non-zero score for this item is warranted even for perpetrators such as Jeffrey Dahmer, who express strong regret and selfrecrimination for actions they describe as driven by uncontrollable, ego-dystonic urges. Moreover, the homicidal acts of serial murderers are typically fantasy driven and enacted for purposes of personal gratification. As psychiatrist Park Dietz said of Jeffrey Dahmer: "His orgasm is more valuable than your life." (A&E Television Networks, 1996) This extreme form of selfishness and the behaviors that go with it-including dehumanization of victims, disregard for their feelings and welfare, and deliberate taking of life-would seem to call for a score of 2 on PCL-R item 8 (callous/ lack of empathy) in cases of this type generally. Furthermore, given that some level of rationalization is inherent to repeated engagement in willful acts of murder (Hickey, 2015), serial killers as a whole are also expected to show elevations on PCL-R item 16, failure to accept responsibility. In cases where the offender readily admits to crimes upon apprehension and takes blame for committing them, such as that of Dahmer, a full rating of 2 may not be appropriate. However, the tendencies toward self-justification and victim objectification that operate in the commission of offenses in cases such as this would warrant at least a 1.

Another reason why the affective features of PCL-R psychopathy may be consistently observed in perpetrators of serial murder is that deficient emotional experience associated with early lack of social connectedness may be a critical stage-setter for behavior of this type. Specifically, our review of serial murder cases to date indicates that feelings of "otherness" and social disengagement beginning in childhood are common among serial murderers. Ted Bundy recalled feeling different from others his age as a youth and unsure about the implicit rules for normal social engagement; as a consequence, he learned to "act the part" in exchanges with others rather than interacting in a more natural, emotion-based manner. Lacking in friendships and regular social activities, Bundy gravitated in adolescence toward antisocial forms of stimulation seeking, including prowling and stalking, thievery, and violent pornography. Jeffrey Dahmer was socially withdrawn and self-absorbed as a youth, avoiding interactions even with members of his family, and spending large amounts of time on his own-collecting and experimenting with animal carcasses found in areas surrounding his home. An extreme introvert by nature, Dahmer's potent sexual fantasies served as impetus for him to develop the skills needed to engage with victims, and his use of alcohol helped him to put these skills into action. Gacy, Kemper, and Ridgway all grew up with severe parental conflict and experienced problems relating to peers at school. As with Bundy and Dahmer, this lack of connectedness appeared to play a significant role in the progression these individuals made toward secretive, antisocial forms of stimulation seeking.

In addition to its potential role as a stage-setter for violent sexual deviancy, this quality of early social disengagement has been discussed as an etiological factor underlying the callous-unemotional (Viding & Kimonis, Chapter 7, this volume) or "meanness" (Patrick, Chapters 1 and 18, this volume) features of psychopathy. Specifically, the triarchic model of psychopathy (Patrick et al., 2009; Patrick & Drislane, 2015) posits that active goalseeking in the absence of normal social connectedness ("disaffiliated agency") is the basis for callous-exploitative behavior. From this perspective, constitutional or experiential factors that contribute to a lack of social connectedness foster behavior of this type-particularly in individuals with an active reward-seeking orientation. The facet of the PCL-R most related to callous unemotionality or meanness is the Affective facet (Venables & Patrick, 2012), and the item from this facet that connects most closely to social disengagement or disaffiliation is the shallow affect item (number 7), which encompasses lack of attachments to other people, along with absence of genuine emotional responses. PCL-R item 8, which indexes absence of concern for other people, also relates to social disconnectedness. The representation of this attribute in these items of the PCL-R adds to the likelihood that the Affective facet of the PCL-R will be elevated in most perpetrators of serial murder.

In summary, the data presented in Table 23.1, together with our ratings of other serial murder cases to date, suggest that the main basis for a systematic association between the phenomenon of serial homicide and the diagnosis of psychopathy lies in the callous–unemotional (meanness) features represented in the Affective facet of the PCL-R. Two potential bases for this systematic association are that (1) deficient remorse, lack of empathy, and rationalization are part and parcel of serial homicide offending, and (2) lack of social connectedness (disaffiliation) contributes to serial murder, as well as to callous–unemotional features of psychopathy.

As a corollary to this, we hypothesize that only a small proportion of serial murderers are "true psychopaths"-that is, individuals with an essential psychopathic disposition who engage in serial homicide. As conceptualized classically (Cleckley, 1976), psychopathy involves a persistent pattern of reckless, irresponsible behavior that pervades the affected individual's life. By contrast, many serial murderers commit their crimes in a secretive, highly compartmentalized manner-maintaining an ostensibly normal pattern of behavior in other areas of life (e.g., residing in a permanent home, maintaining a steady job, being married and raising children). This was clearly the case with John Gacy and Gary Ridgway, as reflected in their very low scores on the Impulsive-Irresponsible facet of the PCL-R. Psychopathic individuals are also characteristically confident, socially engaging, and persuasive in interacting with others across a range of situations. These attributes, represented in the Interpersonal items of the PCL-R, are evident in some serial murderers (e.g., Bundy, Gacy), but not others (e.g., Dahmer, Ridgway), and do not appear central to this type of offending in the same way as Affective features. Rather, serial murder is predominantly a fantasy-driven pattern of behavior that can arise in individuals with different interpersonal styles.

Our perspective, based on work we have done to date on this project, is that essentially psychopathic individuals who engage in serial homicide do so as an expression of a general proneness to deviancy that pervades their lives as a whole. Probable examples of such individuals (not yet rated in our study) are American serial murderer Donald Henry ("Pee Wee") Gaskins and Canadian child killer Clifford Olson. Gaskins and Olson were "deviant children grown up" (cf. Robins, 1966), who led chaotic criminal lives and progressed to murder following periods of incarceration in juvenile and adult prisons for other offenses. By contrast, serial murderers such as Jeffrey Dahmer, John Gacy, and Gary Ridgway are highly specialized in their criminal deviancy-engaging in offense behaviors related largely or exclusively to their aberrant sexual desires. To the extent that these individuals show psychopathic tendencies beyond affective deficits, these other psychopathic tendencies may be products of their circumscribed deviancy as much as causal contributors. For example, the interpersonal features of psychopathy exhibited by Dahmer (lying, manipulativeness) were tied specifically to his criminal activities and efforts to conceal them, and the impulsive features of psychopathy exhibited by Gacy and Ridgway were exhibited mainly in relation to their homicidal acts.

# Conclusion

The scarcity of available empirical research on the topic of serial homicide must be acknowledged. Despite this, research over the past 30 years has led to important insights that have altered how we view and think about perpetrators of serial murder. Importantly, serial murderers are heterogeneous in their social backgrounds and personal characteristics, and many are quite unlike the stereotypical images portrayed in the popular media. Typologies have been developed for classifying subgroups of serial murderers, but these have been developed through qualitative reviews of case information rather than through quantitative analyses of objectively coded data. New typologies are needed that rely on analyses of this type and that incorporate findings from contemporary social and behavioral research, particularly work that takes into account differences in regional and international norms for behavior. Similarly, research is needed to clarify biological, psychological, and social influences contributing to the emergence of violent sexual fantasies and their progression toward enactment.

A major focus of this chapter has been on the interface between psychopathic traits and engagement in serial murder. The findings we have discussed, although intriguing in terms of their implications, are highly preliminary given the small, selective nature of the case sample considered. Further research with larger, more representative samples is needed to clarify whether certain features of psychopathy (e.g., affective deficits) are more central to serial murder than others, and the extent to which configurations of psychopathic features (e.g., score profiles for facets of the PCL-R) might be useful for serial murder subtyping. Systematic research is also needed to examine the interplay between affiliative deficits, sensationseeking tendencies, and fantasy engagement in the development of violent paraphilic tendencies associated with serial murder. It is only through continued, concerted scientific efforts that proper light can shed on this darkest form of human deviance.

#### NOTE

 The case of Charles Manson was atypical in that Manson incited other individuals to commit murders at his behest, rather than committing them himself. However, given the central orchestrating role he played, Manson was convicted, in 1971, of seven counts of first-degree murder and one count of conspiracy to commit murder.

#### REFERENCES

- A&E Television Networks. (1996). A&E biography: Jeffrey Dahmer. New York: Author.
- Arrigo, B. A., & Griffin, A. (2004). Serial murder and the case of Aileen Wuornos: Attachment theory, psychopathy, and predatory aggression. *Behavioral Sciences and the Law*, 22, 375–393.
- Bartol, C. R., & Bartol, A. M. (2013). Criminal and behavioral profiling. Thousand Oaks, CA: SAGE.
- Bonn, S. A. (2014). Why we love serial killers: The curious appeal of the world's most savage murderers. New York: Skyhorse.
- Bugliosi, V., & Gentry, C. (1974). Helter skelter: The true story of the Manson murders. New York: Norton.
- Cleckley, H. (1976). The mask of sanity (5th ed.). St. Louis, MO: Mosby.
- Dahmer, L. (1994). A father's story. New York: Morrow.
- Davis, D. (1991). The Jeffrey Dahmer story: An American nightmare. New York: St. Martin's Press.
- Dimond, D. (2012). Is there a serial killer near you? Retrieved July 25, 2016, from www.huffingtonpost.com/ diane-dimond/orange-county-serial-killer\_b\_1222710. html.
- Dobbert, D. L. (2009). Psychopathy, perversion, and lust homicide: Recognizing the mental disorders that power serial killers. Santa Barbara, CA: Praeger/ABC-CLIO.
- Dobson, J. C., Bundy, T. R., & Focus on the Family Films. (1989). Fatal addiction: Ted Bundy's final interview [with Dr. James Dobson]. Pomona, CA: Focus on the Family Films.

- Douglas, J., Burgess, A. W., Burgess, A. G., & Ressler, R. K. (2006). Crime classification manual: A standard system for investigating and classifying violent crime (2nd ed.). New York: Wiley.
- Douglas, J., Burgess, A. W., Burgess, A. G., & Ressler, R. K. (2013). Crime classification manual: A standard system for investigating and classifying violent crime (3rd ed.). New York: Wiley.
- Dudek, L. A. (2001). When silenced voices speak: An exploratory study of prostitute homicide. Unpublished doctoral dissertation, MCP Hahnemann University, Philadelphia, PA.
- Duwe, G. (2004). The patterns and prevalence of mass murder in twentieth-century America. Justice Quarterly, 21, 729–761.
- Ebrite, T. (2005). Toward a balanced equation: Advocating consistenty in the sentencing of serial killers. *Oklahoma Law Review*, 58, 685–722.
- Egger, S. A. (1998). The killers among us: An examination of serial murder and its investigation. Upper Saddle River, NJ: Prentice Hall.
- Federal Bureau of Investigation. (2011). Highway Serial Killing Initiative. Washington, DC: Behavioral Analysis Unit, National Center for the Analysis of Violent Crime, U.S. Department of Justice.
- Federal Bureau of Investigation. (2012). Crime in the U.S.: Uniform Crime Reports. Washington, DC: U.S. Department of Justice, U.S. Government Printing Office.
- Fox, J. A., & Levin, J. (2015). Extreme killing: Understanding serial and mass murder (3rd ed.). Thousand Oaks, CA: SAGE.
- Frank, G. (1966). The Boston strangler. New York: New American Library.
- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014). Can callous–unemotional traits enhance the understanding, diagnosis, and treatment of serious conduct problems in children and adolescents?: A comprehensive review. *Psychological Bulletin*, 140, 1–57.
- Godwin, G. M. (2008). Hunting serial predators. Burlington, MA: Jones & Bartlett Learning.
- Gorby, B. L. (2000). Serial murder: A cross-national descriptive study. Unpublished master's thesis, California State University, Fresno, CA.
- Hare, R. D. (2003). The Psychopathy Checklist—Revised (2nd ed.). Toronto: Multi-Health Systems.
- Hare, R. D., Hart, S. D., & Harpur, T. J. (1991). Psychopathy and the DSM-IV criteria for antisocial personality disorder. *Journal of Abnormal Psychology*, 100, 391–398.
- Hare, R. D., & Jutai, J. (1983). Criminal history of the male psychopath: Some preliminary data. In K. T. Van Dusen & S. A. Mednick (Eds.), Prospective studies of crime and delinquency (pp. 225–236). Boston: Kluwer-Nijhoff.
- Harpur, T. J., Hare, R. D., & Hakstian, A. R. (1989). Two-factor conceptualization of psychopathy: Con-

struct validity and assessment implications. *Psychological Assessment*, 1, 6–17.

- Harris, T. (1988). The silence of the lambs. New York: St. Martin's Press.
- Hickey, E. W. (2015). Serial murderers and their victims (7th ed.). Belmont, CA: Wadsworth.
- Holmes, R. M., & DeBurger, J. (2008). Serial murder. Thousand Oaks, CA: SAGE.
- Holmes, R. M., & Holmes, S. T. (2010). Serial murder (3rd ed.). Thousand Oaks, CA: SAGE.
- Jenkins, P. (1988). Serial murder in England 1940–1985. Journal of Criminal Justice, 16, 1–15.
- Jenkins, P. (1994). Using murder: The social construction of serial homicide. New York: Aldine de Gruyter.
- LaBrode, R. T. (2007). Etiology of the psychopathic serial killer: An analysis of antisocial personality disorder, psychopathy, and serial killer personality and crime scene characteristics. Brief Treatment and Crisis Intervention, 7, 151–160.
- Logan, M. H., & Hare, R. D. (2008). Criminal psychopathy: An introduction for police. In M. St.-Yves & M. Tanguay (Eds.), Psychology of criminal investigation: The search for the truth (pp. 359–405). Cowansville, Quebec: Editions Yvon Blais.
- McCord, W. M., & McCord, J. (1964). The psychopath: An essay on the criminal mind. Princeton, NJ: Van Nostrand.
- Michaud, S. G., Aynesworth, H., & Bundy, T. (2000). Ted Bundy: Conversations with a killer. Irving, TX: Authorlink.
- Morton, R. J., & Hilts, M. (2008). Serial murder: Multidisciplinary perspectives for investigators. Washington, DC: U.S. Department of Justice, Federal Bureau of Investigation.
- Nelson, P. (1994). Defending the devil: My story as Ted Bundy's last lawyer. New York: Morrow.
- Norris, C. S. (2011). Psychopathy and gender of serial killers: A comparison using the PCL-R. Unpublished doctoral dissertation, East Tennessee State University, Johnson City, TN.
- O'Toole, M. E. (2007). Psychopathy as a behavior classification system for violent and serial crime scenes. In H. E. Hervé & J. C. Yuille (Eds.), *The psychopath: Theory, research, and practice* (pp. 301–325). Mahwah, NJ: Erlbaum.
- Patrick, C. J., & Drislane, L. E. (2015). Triarchic model of psychopathy: Origins, operationalizations, and observed linkages with personality and general psychopathology. *Journal of Personality*, 83, 627–643.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. Development and Psychopathology, 21, 913–938.
- Porter, S., Birt, A. R., & Boer, D. P. (2001). Investigation of the criminal and conditional release profiles of Canadian federal offenders as a function of psychopathy and age. *Law and Human Behavior*, 25, 647–661.

- Porter, S., Woodworth, M., Earle, J., Drugge, J., & Boer, D. (2003). Characteristics of sexual homicides committed by psychopathic and nonpsychopathic offenders. Law and Human Behavior, 27, 459–470.
- Quinet, K. (2007). The missing missing: Toward a quantification of serial murder victimization in the United States. *Homicide Studies*, 11, 319–339.
- Quinet, K. (2011). Prostitutes as victims of serial homicide: Trends and case characteristics, 1970–2009. *Homicide Studies*, 15, 74–100.
- Ramsland, K. (2005). The human predator: A historical chronicle of serial murder and forensic investigation. New York: Berkley Books.
- Ressler, R. K. (1992). Whoever fights monsters. New York: St. Martin's Press.
- Ressler, R. K., Burgess, A. W., & Douglas, J. E. (1988). Sexual homicide: Patterns and motives. Lexington, MA: Lexington Books.
- Robins, L. N. (1966). Deviant children grown up: A sociological and psychiatric study of sociopathic personality. Baltimore: Williams & Wilkins.
- Schecter, H. (1989). Deviant: The shocking and true story of the original Psycho. New York: Pocket Books.
- Schmid, D. (2006). Natural born celebrities: Serial killers in American culture. Chicago: University of Chicago Press.
- Silva, J. A., Ferrari, M. M., & Leong, G. B. (2002). The case of Jeffrey Dahmer: Sexual serial homicide from a

neuropsychiatric developmental perspective. Journal of Forensic Sciences, 47, 1347–1359.

- Stone, M. (2001). Serial sexual homicide: Biological, psychological, and sociological aspects. *Journal of Personality Disorders*, 15, 1–18.
- Ulrich, A. (2000). Morderisches mirakel [Murderous miracle]. Hamburg, Germany: Der Spiegel.
- United Nations Office on Drugs and Crime. (2011). Global study on homicide 2011: Trends, context, data. Vienna: United Nations Office on Drugs and Crime.
- Venables, N. C., & Patrick, C. J. (2012). Psychological Assessment, 24, 88–100.
- Walters, B. K., Drislane, L. E., Patrick, C. J., & Hickey, E. (2015). Serial murder: Facts and misconceptions. *Science and the Courts*, 1, 32–41.
- White-Hamon, L. S. (2000). Mass murder and attempted mass murder: An examination of the perpetrator with an empirical analysis of typologies. Unpublished doctoral dissertation, California School of Professional Psychology at Alliant University, Fresno, CA.
- Woodworth, M., & Porter, S. (2002). In cold blood: Characteristics of criminal homicides as a function of psychopathy. *Journal of Abnormal Psychology*, 111, 436–445.
- Yorker, B. C., Kizer, K. W., Lampe, P., Forrest, A., Lannan, J. M., & Russell, D. A. (2006). Serial murder by healthcare professionals. *Journal of Forensic Sciences*, 51, 1362–1371.

# CHAPTER 24

# Successful Psychopathy

STEPHEN D. BENNING NOAH C. VENABLES JASON R. HALL

uccessful psychopathy" is a concept that has long captured the interest of O researchers and clinicians alike (Smith, 1978; Widom, 1977). This seemingly paradoxical concept has its roots in Cleckley's (1976) landmark monograph, The Mask of Sanity. Cleckley portrayed psychopathy as a personality-based condition that does not necessarily entail severe criminal deviance, and he speculated that people with psychopathy may be found at nearly any occupation or level of society. Indeed, a subset of his case studies described individuals who possessed the "core" personality features observed in institutionalized individuals with psychopathy (e.g., superficial charm, egocentricity, and guiltlessness) but manifested those traits in ways that did not result in frequent arrests or convictions. Others have argued that certain psychopathic traits (e.g., glibness/charm, fearlessness) may serve as valuable personal assets in certain professions, including law, politics, business, or emergency responding (Babiak & Hare, 2006; Lykken, 1995).

Historically, research on psychopathy has focused on samples of incarcerated male offenders. This tradition is potentially problematic because the wealth of findings pertaining to incarcerated criminal psychopathy may not generalize to psychopathy as it is expressed in the community, whether in criminal or noncriminal form.

Furthermore, research on nonincarcerated individuals with psychopathy may contribute to the identification of protective factors, spanning physiological, cognitive, and behavioral domains (Gao & Raine, 2010) that mitigate against chronic engagement in antisocial behavior (Lilienfeld, 1994). Additionally, from a theoretical perspective, research on noncriminal psychopathy may help to address fundamental questions regarding the nature of psychopathy as a clinical phenomenon, such as the following: Does the essence of psychopathy lie in core personality traits rather than in particular behavioral expressions? In the absence of criminal deviance, should the interpersonal-affective features of psychopathy be considered pathological? What is the true nature of the relationship between psychopathy and criminality? From a clinical standpoint, noncriminal individuals with psychopathy are of interest because they may engage in many behaviors that, although not formally illegal, represent significant breaches of social norms and the rights of others. For instance, they may achieve personal or professional successes at the expense of family, friends, and coworkers, leaving a trail of broken relationships. From this perspective, the "successful" psychopathic individual may be well adapted in some areas of life but less successful in other domains of functioning.

Despite long-standing interest in this topic, successful individuals with psychopathy have proven to be an elusive target for research. Efforts to systematically study high-functioning persons with psychopathy in the community have been impeded by methodological obstacles. In particular, identifying and recruiting individuals with high levels of psychopathic traits from the general population pose ongoing challenges given issues of definition (discussed below) and the low prevalence of individuals with extreme psychopathic tendencies in noninstitutional settings. Furthermore, though recent years have seen notable advances in the assessment of psychopathy in community samples (for reviews, see Lilienfeld, 1998; Lilienfeld, Watts, & Smith, 2015), a number of questions remain concerning the basic conceptualization of noninstitutionalized individuals with psychopathy. Specifically, are these individuals "subclinical" versions of incarcerated criminal psychopaths, representing less extreme examples of psychopathy? Or are they fully psychopathic but able to express their extreme personality tendencies in adaptive ways, through reliance on compensatory mechanisms such as high intelligence or effective socialization? To what extent does the etiology of noncriminal psychopathy reflect the complex interplay of multiple processes that appears to characterize clinical psychopathy?

In this chapter, we lay out criteria for the meaning of the term "success" as it interfaces with the concept of psychopathy. Rather than constituting a paradox, we argue that successful psychopathy represents the expression of core psychopathic traits in ways conducive to attaining prominence in some socioecological niche, while avoiding serious adverse consequences (e.g., ostracization, loss of freedom). We then describe three models of successful psychopathy—subclinical psychopathy, moderated psychopathy, and multiprocess psychopathy—and consider each in relation to extant empirical evidence. As a basis for discussing these alternative models, we first consider key definitional issues.

# **Defining Success in Psychopathy**

#### A Misnomer

Some theorists posit that "successful psychopathy" is an inherent contradiction in terms (Kiehl & Lushing, 2014). In this view, the notion of an individual with psychopathy is an oxymoron because qualifying for a personality disorder requires impairment in multiple domains of life. Thus, there

is no way for someone with such serious psychopathology to be considered successful.

However, examples abound of individuals with other severe forms of psychopathology who manage to attain success in life. For example, Temple Grandin, a renowned professor of animal science, used her unique, autism-related visual-cognitive style to devise new methods for handling animals humanely (Grandin, 2010). Extending from her own experience, she has also documented the stories of other non-neurotypical people from a range of occupations (Grandin, 2012), who have succeeded in distinct ways using their non-normative cognitive processing capacities despite the profound effects of their neurodevelopmental conditions on other aspects of their daily lives. Similarly, the autobiography of psychologist Kay Redfield Jamison (1995) details in poignant fashion her struggles with bipolar disorder, despite which she rose to the position of Professor of Psychiatry at the Johns Hopkins University School of Medicine and earned prestigious honors, including a MacArthur Fellowship. She also published a book (Jamison, 1993) detailing the lives of others with bipolar disorder who have achieved visible success as artists, though in many cases struggling in other areas of their lives.

Some individuals with schizophrenia have also managed to attain high levels of professional success. One example is law professor Elyn Saks, whose 2007 memoir recounts her pathway to prominence as legal scholar and mental health policy advocate (for which she was awarded a MacArthur Fellowship "genius grant") while suffering from symptoms of schizophrenia severe enough to require multiple psychiatric hospitalizations. Another is John Nash, who achieved enormous success as a mathematician, earning a Nobel Prize in economics for his pioneering work on the topic of game theory, despite ongoing episodes of psychotic illness. His inspiring life story was the subject of Sylvia Nazar's (1998) acclaimed biography, A Beautiful Mind, which details Nash's rise to prominence in the field of mathematics, his struggles with schizophrenic illness following early career milestones, and his ultimate triumphs both professionally and personally.

As these examples illustrate, some individuals suffering from other severe and potentially intractable psychological disorders have gone on to live productive, fulfilling lives—even when their lives have been far from free of troubles or substantial impediments. Considering cases such as these, it does not seem far-fetched to suppose that some individuals with strong psychopathic tendencies may achieve success in visible spheres of activity. One such example may be eminent neuroscientist James Fallon, who portrays himself as a successful psychopath in his best-selling 2013 autobiography, *The Psychopath Inside*. Fallon recounts becoming aware of strong psychopathic tendencies in himself after viewing a structural scan of his own brain and noting its resemblance to those of psychopathic murderers.

To be clear, we do not suggest that people with psychopathy who attain success are necessarily free from adverse consequences of their personality pathology. The life stories summarized earlier indicate that disorders that affect diverse aspects of cognitive, emotional, and interpersonal functioning create substantial hardships for those who are afflicted, along with their family and friends. However, such hardships do not preclude all afflicted individuals from attaining prosperity and meaningful relationships with others. Below, we consider what success entails for individuals with psychopathic traits. We begin by considering a basic definition of "success" in psychopathy: simply managing to avoid the worst outcomes possible in life.

#### Avoiding Undesirable Outcomes

## Incarceration

One of the most common undesirable outcomes that successful individuals with psychopathic traits are reputed to avoid is incarceration. Among adjudicated offenders, high and intermediate levels of psychopathy are associated with a higher proportion of crimes going undetected than low levels of psychopathy (Aharoni & Kiehl, 2013), suggesting that higher psychopathy is associated with more effective evasion of legal contact. However, in absolute terms, higher psychopathy tends to be associated with earlier and more extensive criminal arrests/convictions. Given this, some theorists have used the lack of any lifetime incarcerations as a criterion for success in individuals with psychopathy. Following from this, the most basic approach to studying successful psychopathy is to test individuals residing in the community who score high in psychopathic traits. Undergraduate samples have been a popular target for this kind of research (e.g., Lynam et al., 2011), though samples from the broader community (including twin samples; Blonigen, Hicks, Krueger, Patrick, & Iacono, 2006) have also been used.

Another approach is to target sectors of society in which individuals are likely to be higher on average in psychopathic tendencies. As an example of this, Adrian Raine and his research group pioneered an approach to studying high-psychopathic individuals without prior histories of imprisonment by recruiting participants from temporary employment agencies (Ishikawa, Raine, Lencz, Bihrle, & Lacasse, 2001). In general, individuals seeking work through such agencies score higher in psychopathic traits than individuals from the general community (Ishikawa et al., 2001; Raine et al., 2004; Yang et al., 2005), presumably because certain features of psychopathy (e.g., impulsiveness, lack of planning, lack of concern for others, irresponsibility) are detrimental to job stability. In initial work using this recruitment approach, Raine and colleagues (2004) assessed participants using the Psychopathy Checklist—Revised (PCL-R; Hare, 2003) and subdivided those scoring high into "successful" and "unsuccessful" groups based on conviction status as determined by self-report and state court records (Ishikawa et al., 2001). Later studies by this group operationalized history of criminality in a more thorough way, with individuals designated "successful" only if they were found to be free from convictions at the state level in nationwide database searches; had conviction-free federal criminal records; and were not involved in civil actions, liens, or other financial judgments (Gao, Raine, & Schug, 2011). This latter work by Raine and colleagues highlights the comprehensive nature of assessments that must be undertaken to ensure that individuals are free from any lifetime criminal convictions.

Another community-based population that can be expected to show elevated levels of psychopathic traits consists of patients and friends of patients from hospital emergency waiting rooms (Benning et al., in press). Like individuals who register with temporary employment agencies, individuals in these settings tend to be similar in average socioeconomic status to incarcerated samples and more diverse in terms of social background than undergraduates or general community recruits.

Finally, there is a decades-long tradition of using specialized advertisements to attract people with psychopathic traits into the laboratory (Miller, Jones, & Lynam, 2011; Sellbom, Wygant, & Drislane, 2015; Widom, 1977). Though the rates of convictions in samples recruited this way have varied from approximately 33% (Widom & Newman, 1985) to 100% (Belmore & Quinsey, 1994), they uniformly feature elevated (albeit still subclinical; DeMatteo, Heilbrun, & Marczyk, 2006) levels of psychopathic traits compared to samples from the broader community.

## Psychopathology

Incarceration is only one undesirable outcome associated with psychopathy. Engagement in a reckless, irresponsible lifestyle typically results in health problems for the individual, as well as external sanctions. Karpman (1941) was one of the first to describe how other psychopathological states can accompany psychopathy; in his view, psychological disturbance occurred hand in hand with antisocial behavior in many cases. Contemporary empirical research has demonstrated that psychopathy, particularly its impulsive-antisocial features, is systematically associated with problems such as alcohol and drug dependence, as well as with rule breaking and aggression (Patrick, Hicks, Krueger, & Lang, 2005). Better-functioning, successful psychopathic individuals are expected to show fewer problems of these types: Rule breaking, to the extent it occurs, is less apt to lead to legal problems, and substance use is more likely to be recreational than habitual.

The other type of mental health problem that occurs with high frequency in the general population is internalizing psychopathology-encompassing anxiety- and depression-related problems. The relationship between psychopathic tendencies and problems of this type is somewhat complex: The impulsive-antisocial features of psychopathy are associated with increased anxious-depressive tendencies, whereas the core personality features (in particular, the interpersonal symptoms) are associated with decreased anxiousdepressive tendencies (Benning, Patrick, Blonigen, Hicks, & Iacono, 2005; Hall, Benning, & Patrick, 2004; Hicks & Patrick, 2006). Thus, susceptibility to internalizing problems may depend on an individual's specific configuration of psychopathic tendencies (cf. Hicks & Drislane, Chapter 13, and Patrick, Chapter 1, this volume). To the extent successful psychopathy entails the presence of salient interpersonal-affective features in the absence of strong impulsive-disinhibitory tendencies (as discussed further below), one would expect it to be associated with reduced susceptibility to problems of this type.

## Attaining Desirable Outcomes

Avoiding severe undesirable outcomes such as incarceration is a low bar for considering a person successful. Drawing on prior research on measurement of life success (Parker & Chusmir, 1992), a study by Ullrich, Farrington, and Coid (2008) examined psychopathy in relation to "success" in distinct domains of status attainment and intimate relationships, corresponding to the high poles of the agency and communion dimensions of the interpersonal circumplex (Wiggins, 1991). In this study, the affective, impulsive-irresponsible, and antisocial facets of psychopathy as assessed by the Psychopathy Checklist: Screening Version (PCL:SV; Hart, Cox, & Hare, 1995) were all negatively associated with status attainment; the affective facet was negatively related to intimate relationships. These results suggest that psychopathic tendencies may not be conducive to success in relation to agentic pursuits or communal goals. However, it should be noted that the items of the PCL:SV, like those of the PCL-R, strongly emphasize deviant behavioral tendencies (Patrick, Hicks, Nichol, & Krueger, 2007). Thus, the findings of Ullrich and colleagues (2008) may primarily apply when the measurement of psychopathic tendencies is heavily influenced by behavioral deviance.

## Agency

Notwithstanding the findings of Ullrich and colleagues (2008), there are conceptual and empirical reasons for hypothesizing that psychopathic traits may contribute to success in areas involving goal-oriented activity (agency). For instance, psychopathic individuals might be expected to cope well in socioecological niches that favor the ruthless pursuit of status. Environments of this type feature dense, transient populations and encourage individual-level approaches to resource attainment that are advantageous to psychopathic individuals and make their social pathology less detectable (Kinner, 2003). Modern business has been identified as one occupational niche that rewards psychopathic behavior (Wexler, 2008)—in particular, business enterprises with characteristics (e.g., large size, rapid growth in operations, frequent restructurings) that foster instability in employee relations and insulate individuals from the interpersonal consequences of their selfserving interactions (Babiak, 1995). Consistent with this idea, there is evidence that workers in professional settings are more likely to come into contact with individuals with psychopathic traits than are clerical or other junior workers (Boddy, Ladyshewsky, & Galvin, 2010). In addition, other work suggests that high psychopathic tendencies are 3.5 times more common in individuals at senior levels of corporate management compared to the general population (Babiak & Hare, 2006). However, there is also some evidence that individuals with psychopathic traits are more oriented toward realistic or practical jobs that involve hands-on work and feature less emphasis on interpersonal interactions (Jonason, Wee, Li, & Jackson, 2014).

Heroism is another form of societal success that shows some association with the interpersonal-affective features of psychopathy. This association shows up most clearly when these features are indexed separately from the disinhibitory features of psychopathy. The self-report-based Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996; Lilienfeld & Widows, 2005) provides a means for separating these symptomatic components of psychopathy. In contrast with the PCL-R, the PPI operationalizes psychopathic tendencies in terms of two uncorrelated dimensions (factors), labeled Fearless Dominance and either Impulsive Antisociality (Benning, Patrick, Blonigen, et al., 2005) or Self-Centered Impulsivity (Lilienfeld & Widows, 2005). Across a variety of samples, Fearless Dominance as indexed by the PPI and related measures (cf. Drislane, Patrick, & Arsal, 2014) is associated with everyday heroism (Smith, Lilienfeld, Coffey, & Dabbs, 2013), in which people provide aid to others at the risk of minor physical danger to themselves. Fearless Dominance is also associated with engagement in occupations involving high levels of physical risk (Lilienfeld, Latzman, Watts, Smith, & Dutton, 2014), suggesting that some individuals with psychopathic traits may succeed by channeling their propensities for venturesomeness and risk taking in societally acceptable directions. However, these findings may not generalize to the most extreme levels of heroic bravery: Unlike extraordinarily altruistic heroism, extraordinarily brave heroism does not seem to be related to personality dimensions (Walker, Frimer, & Dunlop, 2010), including those associated with psychopathy (Benning, Patrick, Salekin, & Leistico, 2005).

#### Communion

In considering the relationship between psychopathy and communal behavior, it is important to consider the distinction between social engagement (gregariousness) and social closeness (warmth). Though psychopathic individuals characteristically interact regularly with other people, and psychopathy is unrelated to deficits in theory of mind (i.e., ability to deduce the thoughts/motives of others), it is negatively related to empathic concern for others (Blair, 2008; Mullins-Nelson, Salekin, & Leistico, 2006; Seara-Cardoso, Neumann, Roiser, McCrory, & Viding, 2012; Wai & Tiliopoulos, 2012). Psychopathic individuals are more likely to befriend others for instrumental than for affiliative reasons (Jonason & Schmitt, 2012), which may cause others to dislike interacting with such individuals in cooperative situations (Rauthmann, 2012). Additionally, psychopathic traits are associated with defection against coparticipants in the Prisoner's Dilemma game (Rilling et al., 2007), particularly against people who are viewed as low in value (Gervais, Kline, Ludmer, George, & Manson, 2013). Indeed, Mealey (1995) proposed a sociobiological model of psychopathy that characterizes people with psychopathy as deceptive cheaters, whose proclivities for antisocial behavior are genetically determined. They tend to prize quantity over quality in intimate relationships, viewing romantic encounters as sources of fun (Jonason & Kavanagh, 2010) rather than as sources of commitment and intimacy (Ali & Chamorro-Premuzic, 2010).

To the extent that psychopathy has been linked to communal success, it has mainly been in relation to having multitudinous (typically shortterm) sexual partners (Hare, 2003; Jonason, Li, Webster, & Schmitt, 2009; Jonason, Valentine, Li, & Harbeson, 2011). Though this kind of sexuality may theoretically result in greater reproductive success (Nadelhoffer & Sinnott-Armstrong, 2010; Wiebe, 2004), it has yet to be established empirically whether this is actually the case (Gladden, Figueredo, & Jacobs, 2009; Glenn, Kurzban, & Raine, 2011). As successful as individuals with psychopathic traits may be in poaching others' sexual partners, they also appear more vulnerable to having their own sexual partners poached, yielding a net neutral effect on their reproductive fitness (Jonason, Li, & Buss, 2010). Furthermore, frequent sexual engagement does not necessarily reflect communal motives-particularly in the case of psychopathic individuals, whose sexual behavior tends to be coercive in nature rather than affiliative (Harris, Rice, Hilton, Lalumiére, & Quinsey, 2007; Jonason et al., 2010; Muñoz, Khan, & Cordwell, 2011). Potential partners may also be sensitive to how unsuitable individuals with psychopathy can be as mates: Characters in vignettes who exhibit psychopathic attitudes are rated lower in attractiveness and desirability, either as shortterm sexual partners or long-term mates (Rauthmann & Kolar, 2013).

## Synthesis of Perspectives on Success in Psychopathy

We argue that successful psychopathy requires a combination of avoiding bad consequences in life and attaining some measure of bona fide agentic success. Simply avoiding loss of life or livelihood as a consequence of severe antisocial actions is insufficient to qualify someone as successful. At the same time, a person can achieve a high level of professional success and still be unsuccessful in life as a whole. For instance, Jordan Belfort (known as "the Wolf of Wall Street"; Belfort, 2007) started out as a successful meat vendor and Wall Street broker before founding the Stratton Oakmont brokerage firm-a company that thrived on fraudulent ("pump and dump") stock investments. Belfort's conviction for offenses related to these activities required him to pay \$110 million in restitution to his victims. This high-profile case highlights the fact that an individual with psychopathic traits who appears highly successful at one point in time may fail spectacularly at a later point and therefore no longer qualify as successful. Thus, the designation of an individual with psychopathic traits as successful should be considered provisional, subject to revision based on later biographical events.

With these caveats in mind, we now consider the ways in which successful psychopathy can manifest itself. Two models—subclinical and moderated psychopathy—conceive of psychopathy as a unitary construct, and of successful people with psychopathy as partially afflicted individuals, or as fully afflicted individuals who possess compensatory attributes that promote success. In contrast, the third (multiprocess) model conceives of psychopathy as a configural condition encompassing separable dispositional tendencies, with prospects for successful versus unsuccessful outcomes determined by the relative strength of one disposition relative to others.

# Models of Successful Psychopathy Subclinical Psychopathy

One of the oldest models of successful psychopathy conceives of it as a partial variant (*forme fruste*) of the full disorder, entailing lower levels of the underlying mechanisms or processes that account for its full expression. Some theorists conceptualize subclinical psychopathy through use of analogous constructs such as aberrant self-promotion (Gustafson & Ritzer, 1995), but most theorists assess

it using existing measures of psychopathy. Because psychopathy is a dimensional construct rather than a discrete (taxonic) entity (Guay, Ruscio, Knight, & Hare, 2007; Marcus, John, & Edens, 2004; Murrie et al., 2007; Walters, Brinkley, Magaletta, & Diamond, 2008), studies of subclinical psychopathy target the same construct as those of clinical psychopathy, albeit in an attenuated form. Cleckley's (1976) case studies emphasized how relatively successful individuals with psychopathy still exhibit irresponsibility, poor planning, and intemperance. However, his more successful patients lacked exploitative and antisocial tendencies, tending to harm themselves more than others through their aimlessly disinhibited behavior. Models of psychopathy that view antisocial behavior as central to the disorder (Hare & Neumann, 2010; Neumann, Hare, & Newman, 2007) would consider a lack of such behavior to be indicative of subclinical rather than full psychopathy.

However, empirical work suggests that successful psychopathy involves the presence of adaptive attributes rather than just lower pathological tendencies-in particular, attributes of planfulness and dutifulness. Within the normal-range personality literature, expert prototype studies have shown that successful psychopathy is characterized by normative levels of conscientiousness (Mullins-Sweatt, Glover, Derefinko, Miller, & Widiger, 2010) relative to unsuccessful psychopathy, which is associated with low scores on multiple facets of conscientiousness (Miller, Lynam, Widiger, & Leukefeld, 2001). In view of other work showing that conscientiousness is associated with occupational success and affiliated tendencies (i.e., selfefficacy and difficulty of self-defined goals; Brown, Lent, Telander, & Tramayne, 2011), the presence of higher conscientiousness may set the stage for relative success in individuals with psychopathic tendencies. From this standpoint, individuals with subclinical psychopathy may set more challenging goals for themselves and believe themselves to be more competent to achieve those goals, allowing them to succeed at their agentic pursuits.

One fictional example of an individual who appears to exhibit subclinical psychopathy is Michael Corleone in the Oscar-winning film *The Godfather* (Coppola, 1972). Having been raised in a family of individuals with salient psychopathic tendencies, Michael acquires a sense of structure and focus by joining the military during World War II despite his father's obtaining draft deferrals for him. As a consequence, Michael is organized and goal-oriented, yet emotionally detached and possessed

of a deviously aggressive mind. His psychopathic tendencies are not expressed in a salient antisocial manner until he learns of an assassination attempt on his father, which prods him into a methodical campaign of murderous retribution. Along similar lines, Walter White, the central character in the television series *Breaking Bad* (Gilligan et al., 2009), combines effective planning skills with ruthless self-interest to ascend from low-paying jobs as a high school chemistry teacher and car wash attendant to leadership of a methamphetamine manufacturing and distribution empire.

## Moderated Psychopathy

The moderated psychopathy model proposes that successful and unsuccessful psychopathy share not only a common etiology but also equivalent severity of the basic underlying pathology. However, because psychopathy itself is negatively correlated with many forms of success (Ullrich et al., 2008), this perspective posits that the relationship between psychopathy and various forms of success is moderated by intervening variables. In this view, the critical difference between the two alternative manifestations (phenotypic expressions) of psychopathy-successful versus unsuccessful-arises from moderating factors that shape the behavioral expression of the underlying pathological disposition (genotype). For example, the antisocial expression of a core psychopathic disposition may be attenuated or diverted by compensatory factors such as age, intelligence, exceptional talent, highly effective socialization, or physiological attributes (e.g., heart rate reactivity, more gray matter in the brain) that constrain the expression of externalizing tendencies. Thus, bright or well-disciplined individuals may recognize and avoid the pitfalls of serious antisocial behavior and instead express their psychopathic tendencies via socially sanctioned outlets such as business, music, politics, athletics, and so on. Such individuals may even excel in their licit pursuits, in which case they might be considered truly "successful."

This perspective is best exemplified by Lykken's (1957, 1995) fearlessness hypothesis of psychopathy, in which the genotype for psychopathy is presumed to entail a specific deficit in fear reactivity. In the absence of exceptional parenting, according to Lykken, the child with a relatively fearless temperament will be resistant to socialization and will likely evolve into an antisocial psychopath. However, Lykken (1995) argued that society's heroes, leaders, and adventurers are products of the same fearless genotype as the psychopath, with the difference being effective (as opposed to poor) socialization, perhaps in conjunction with other protective factors such as high intelligence and increased opportunities afforded by high socioeconomic status.

The character Hank Moody in the Showtime network series *Californication* (Kapinos, 2007) represents an individual whose verbal facility and intelligence combine with his charm to allow him to avoid serious legal consequences despite repeated engagement in fights, problematic sexual encounters with multiple women, and periods of dissolute behavior fueled by alcohol abuse. Conversely, the character of Frank Underwood in the series *House of Cards* (Willimon, 2013) enjoys high socioeconomic status as a successful politician, an occupation that provides him with the financial resources and social capital needed to protect himself against the consequences of his profoundly amoral ascent to power.

# Multiprocess Psychopathy

Unlike other models of successful psychopathy, the multiprocess model assumes that psychopathy is not a unitary construct. Rather, it views psychopathy as involving separate underlying processes that contribute in differing ways to the observable (phenotypic) features of the disorder. The intersection of these processes creates a compound trait (Smith, Fischer, & Fister, 2003) that is greater in its effects as a whole than the sum of its parts (Lilienfeld, Patrick, et al., 2012). As we describe below, the dual process theory of psychopathy posits two distinctive processes contributing to its symptomatic features, one that correlates positively with adaptive functioning, and the other that relates negatively to adaptive functioning. From this standpoint, psychopathy as a whole is not associated with either adaptive or maladaptive functioning. Instead, the relative admixture of the processes underpinning psychopathy influences whether an individual is more or less successful in life. In some respects, this model is a more specific version of the subclinical model in that it views successful psychopathy as involving a high level of core psychopathic tendencies that allow for or promote success, along with low levels of dispositional tendencies that foster maladaptive outcomes. To the extent that maladaptive expressions of psychopathy are considered necessary for a diagnosis of clinical pathology (Lynam & Miller, 2012), the multiprocess model allows for the adaptive features
associated with psychopathy to act as moderators of antisocial behavioral expressions.

The major multiprocess theory in the current psychopathy literature is the two-process (Patrick & Bernat, 2009) or dual pathway theory (Fowles & Dindo, 2009). This theory posits that separate genetically based neural mechanisms contribute differentially to the interpersonal-affective and impulsive-antisocial features of psychopathy. Specifically, deficient defensive (fear) reactivity is theorized to contribute more to the interpersonalaffective features, and impaired cognitive-executive functioning is theorized to contribute more to the impulsive-antisocial features (and to externalizing forms of psychopathology more broadly). Prior research has provided compelling support for this theoretical model, as the two components of psychopathy, whether indexed by the two broad factors of the PCL-R or those of the PPI, exhibit diverging associations with external criterion variables across a range of domains-including personality, adaptive functioning, other forms of psychopathology, and psychophysiological reactivity (for reviews, see Patrick, 2007; Patrick & Bernat, 2009; Skeem, Polaschek, Patrick, & Lilienfeld, 2011). The factors of the PPI have provided a particularly valuable reference point for the two-process model because they are independent of one another and therefore show clear, contrasting associations with various criterion measures (including variables from domains of self-report, clinical diagnosis, behavior, and physiology; Patrick & Bernat, 2009), without the need to control for their overlap statistically.

The two-process theory of psychopathy was advanced as a model of etiological mechanisms contributing to its separable interpersonal-affective and impulsive-antisocial facets. A complementary model, the triarchic conceptualization (Patrick, Fowles, & Krueger, 2009), was formulated to reconcile contrasting historic accounts of psychopathy and to clarify how alternative assessment inventories for psychopathy compare in terms of coverage. Historical accounts of psychopathy have varied in the degree to which maladaptive criminological features (e.g., callousness, aggression, cruelty) have been emphasized (e.g., McCord & McCord, 1964) relative to features such as low anxiousness and social adeptness (e.g., Cleckley, 1976). The triarchic model proposes that these contrasting historical conceptions of psychopathy, and contemporary instruments for assessing it, differ in the relative emphasis they place on three distinguishable phenotypic constructs: dis*inhibition* (deficient impulse control behavior and dysregulated negative affect), *meanness* (deliberate cruelty and aggressive exploitation of others), and *boldness* (relative fearlessness, resilience to stress, and social effectiveness).

While the triarchic model focuses on phenotypic expression rather than etiology, it can be readily related to the two-process etiological model: Weak defensive reactivity is seen as contributing most directly to the boldness facet of psychopathy, whereas impaired cognitive-executive function is viewed as contributing most directly to the disinhibition facet (Patrick & Drislane, 2015; Patrick et al., 2009). Based on theory and empirical data, the meanness component of psychopathy is posited to involve some contribution of dispositional fearlessness (accounting for its phenotypic overlap with boldness; Drislane & Patrick, 2017; Patrick et al., 2009), along with a separate core mechanism of weak affiliative capacity (Patrick & Drislane, 2015; Patrick et al., 2009). Further research is needed to confirm the contribution of this latter mechanism to meanness, which would in turn call for revision of the two-process model.

In triarchic model terms, advertising executive Don Draper in the series Mad Men (Weiner, 2007) combines boldness (e.g., as evidenced by his persuasive sales pitches and assertive office behavior) with disinhibition (e.g., in terms of his alcohol use and casual antisocial acts). Another fictional character who exhibits this configuration of tendencies is Sonny, Michael Corleone's brother in The Godfather, whose fearless charm allows him to ascend to the summit of power, only to be gunned down when his enemies capitalize on his impulsive hotheadedness. Conversely, the character Amy Dunne in the best-selling novel Gone Girl (Flynn, 2012) demonstrates tendencies toward boldness in her charming manipulation of friends and media personnel, along with tendencies toward meanness in the form of callous and at times violent exploitation of other people, including her parents and philandering husband.

### Synthesis of Models of Successful Psychopathy

Through references to theoretical writings, empirical findings, and illustrative examples, we have fleshed out three possible models of successful psychopathy. The subclinical and moderated models provide alternate conceptualizations of the disorder to explain the avoidance of serious adverse outcomes and the attainment of desirable outcomes. By contrast, the multiprocess model posits that different etiological mechanisms give rise to the observable features of psychopathy, and that the contribution of certain processes relative to others in individual cases determines successful versus maladaptive outcomes. In two-process model terms, for example, successful outcomes are more likely when cognitive–executive dysfunction plays less of a role in psychopathic tendencies and dispositional fearlessness plays more of a role.

While grounded in differing assumptions, these three perspectives do not necessarily represent competing, mutually exclusive theories of successful psychopathy. Rather, they may be viewed as complementary approaches that address different issues and target populations. The subclinical perspective is mainly concerned with clarifying how the etiologies of criminal and noncriminal psychopathy overlap, and documenting the characteristics and behavior of high-psychopathic individuals outside of correctional settings. The moderated conception seeks to identify characteristics that differentiate criminal from noncriminal psychopaths in the interest of identifying possible protective factors. Finally, the multiprocess perspective is concerned with investigating potentially adaptive expressions of psychopathic traits and determining how differences in mechanisms underlying psychopathy can give rise to noncriminal variants. We review in the next section the empirical findings pertaining to each of these conceptualizations.

### Evidence for Models of Successful Psychopathy

### Subclinical Psychopathy

### Commonalities with Clinical Psychopathy

Whether assessed through clinical or self-report measures in undergraduate, community, or incarcerated samples, psychopathy has a consistent set of personality correlates. Both clinical and subclinical psychopathy are negatively associated with Agreeableness and Conscientiousness within the five-factor model of normal-range personality (Jakobwitz & Egan, 2006; Lynam et al., 2011; Lynam & Widiger, 2007; Ross, Benning, Patrick, Thompson, & Thurston, 2009). They are also associated with behavioral disconstraint and the aggression facet of negative emotionality in Tellegen's three-factor model of personality (Gaughan, Miller, Pryor, & Lynam, 2009; Verona, Patrick, & Joiner, 2001). In line with clinical lore (Hare, 1985), successful individuals with psychopathy score higher on older and newer versions of Scale 4 (psychopathic deviance) of the Minnesota Multiphasic Personality Inventory (MMPI) instruments (Sellbom, Ben-Porath, Lilienfeld, Patrick, & Graham, 2005; Sellbom, Ben-Porath, & Stafford, 2007; Sellbom et al., 2012), and in some work, impulsive–manic tendencies, as indexed by Scale 9 (Sutker & Allain, 1983; Widom, 1977).

Like its clinical counterpart, subclinical psychopathy is correlated with alcohol and illicit drug use, along with symptoms of antisocial personality disorder (Coid, Yang, Ullrich, Roberts, & Hare, 2009; Lynam, Whiteside, & Jones, 1999; Zimak, Suhr, & Bolinger, 2014). The rate of lifetime antisocial behavior in community members recruited through psychopathy-related advertisements is typically over 50% (DeMatteo et al., 2006) and may be as high as 100% (Belmore & Quinsey, 1994). Both the laboratory behavior of undergraduates high in self-reported psychopathy (Buckels, Jones, & Paulhus, 2013; Reidy, Zeichner, Miller, & Martinez, 2007) and the offense histories of prisoners identified as psychopathic (Cima & Raine, 2009; Walsh, Swogger, & Kosson, 2009) demonstrate strong propensities for instrumental aggression against other people, though the link between instrumental aggression and subclinical psychopathy may be stronger for men than for women (Hecht, Berg, Lilienfeld, & Latzman, 2016).

Of note, some evidence indicates that noncriminal participants (i.e., undergraduates or community adults) high in psychopathic traits show deficits on cognitive-executive tasks theorized to reflect frontal brain function (e.g., Porteus Maze Test; Snowden, Gray, Pugh, & Atkinson, 2013; Sutker & Allain, 1983) akin to those shown by psychopathic offenders (Bagshaw, Gray, & Snowden, 2014). Like high-psychopathy offenders (Hughes, Dolan, Trueblood, & Stout, 2015; Mitchell, Colledge, Leonard, & Blair, 2002), undergraduate participants with psychopathic traits also show impairments in reward-based reversal learning as indexed by the Iowa gambling paradigm (van Honk, Hermans, Putman, Montagne, & Schutter, 2002) and similar tasks (Belmore & Quinsey, 1994), continuing to choose decks with large potential rewards even after they have become more punishing in the long run (Mahmut, Homewood, & Stevenson, 2008; cf. Zimak et al., 2014). In the domain of response inhibition, individuals with subclinical psychopathy recruited from the community via advertisements show evidence of passive avoidance deficits in punishment-learning tasks (Newman, Widom, & Nathan, 1985), replicating classic findings with high-psychopathy offenders (Lykken, 1957). Furthermore, the magnitude of observed passive avoidance learning deficits correlates with psychopathy scores in undergraduates, as do deficits in go/no-go task performance (Lynam et al., 1999). Undergraduates high in psychopathic traits also show increased errors of commission in a simple stop-signal task lacking in reward–punishment contingencies (Zimak et al., 2014).

### Differences from Clinical Psychopathy

The relationship between psychopathic tendencies and performance on tasks indexing risk taking and aggression appears to differ in nonclinical as compared to offender samples. For example, the number of adjusted pumps and balloon explosions in the Balloon Analogue Risk Task (BART; Lejuez et al., 2002)-which predicts engagement in realworld risky behaviors (Swogger, Walsh, Lejuez, & Kosson, 2010)—is positively correlated with psychopathic traits in undergraduates (Hunt, Hopko, Bare, Lejuez, & Robinson, 2005) but is unrelated to psychopathic tendencies in incarcerated participants. Even more strikingly, psychopathy is negatively related to reactive aggression in inmates (Veit et al., 2010) but positively related to reactive aggression in undergraduate participants (Jones & Paulhus, 2010; Lotze, Veit, Anders, & Birbaumer, 2007; Reidy et al., 2007). It is unclear whether the contrasting associations for psychopathy in undergraduate compared with offender samples result from ceiling effects in the latter (which seems more likely for the BART findings) or genuine differences between the two in expressions of psychopathy (which may the case for reactive aggression).

Given the evidence for elevated externalizing behavior even for subclinical psychopathy in the community, studying samples with subclinical levels of psychopathy may prove useful for understanding everyday antisocial expressions of psychopathic tendencies. For example, higher psychopathy in community participants has been shown to predict gambling with others' money in the laboratory (Jones, 2014), along with engaging in and enjoying harassing other Internet users (Buckels, Trapnell, & Paulhus, 2014). In undergraduates, subclinical psychopathy is associated with realworld cheating on classroom exams (Nathanson, Paulhus, & Williams, 2006b), proclivities toward body modification and tattoos (Nathanson, Paulhus, & Williams, 2006a), and preferences for antisocial forms of entertainment (Williams, Paulhus, & Hare, 2007). Some of these associations may be accounted for by flexible moral attitudes espoused by individuals with subclinical psychopathy. Consistent with this possibility, moral disengagement and disinhibitory tendencies mediate observed relations between subclinical psychopathy and both academic cheating (Williams, Nathanson, & Paulhus, 2010) and unethical decision making (Stevens, Deuling, & Armenakis, 2012).

Subclinical psychopathic dispositions may also be channeled into socially appropriate activities. Psychopathy scores are higher on average for undergraduates who choose to study business as opposed to the arts or science (Wilson & McCarthy, 2011), and interpersonal-affective features of psychopathy predict success in social entrepreneurship among undergraduates (Akhtar, Ahmetoglu, & Chamorro-Premuzic, 2013), although perhaps not (as mentioned earlier) among individuals from the general community (Ullrich et al., 2008). However, caution is warranted in interpreting these correlates of subclinical psychopathy as "positive": Within organizations, subclinical psychopathy is associated with pursuing career advancement through social manipulation instead of competence (Chiaburu, Muñoz, & Gardner, 2013). Similar to findings for students (Stevens et al., 2012; Williams et al., 2010), a willingness to tolerate unethical practices mediates the relationship between psychopathy and publication rates for academic accountants (Bailey, 2015).

### Moderated Psychopathy

#### Age

Increasing age over the course of adulthood is one of the most robust predictors of decreases in criminal activity (Hirschi & Gottfredson, 1983), and it also predicts the accumulation of income and other resources that relate to success (Mincer, 1958). However, age has been investigated as a moderator of success in relation to psychopathy mainly in incarcerated offender samples. Consistent with the broader literature, older individuals with psychopathic tendencies commit fewer crimes following discharge from prison or while on conditional release, particularly after the age of 40 (Porter, Birt, & Boer, 2001). Indeed, contrary to the notion that psychopathy is consistently associated with a lifelong pattern of offending, psychopathy scores during incarceration no longer predicted criminal behavior over a 20-year followup interval (Olver & Wong, 2015).

### Intelligence and Executive Functioning

Because intelligence is negatively associated with crime (Hirschi & Hindelang, 1977; White, Moffitt, & Silva, 1989) but not with psychopathy itself (Hare & Neumann, 2008), it may serve as another moderator of success in psychopathy. Early research along this line found that higher intelligence is associated with reduced criminal offending in individuals with psychopathy (Heilbrun, 1979; Heilbrun & Heilbrun, 1985), leading theorists to suspect that intelligence may be a protective factor against incarceration and recidivism in psychopathy (Beggs & Grace, 2008). However, most subsequent studies have failed to detect a significant interaction between psychopathy and intelligence in predicting legal contacts, incarceration, or recidivism (Holland, Beckett, & Levi, 1981; Walsh, Swogger, & Kosson, 2004; Watts et al., 2016); in some cases, increased intelligence has been found to enhance the association between psychopathy and offense criteria (e.g., early onset of criminal offending, conditional release failures; Johansson & Kerr, 2005). Similarly, among youth with psychopathic traits, intelligence either fails to moderate the relationship between callous-unemotional traits and antisocial behavior (Allen, Briskman, Humayun, Dadds, & Scott, 2013) or is associated with increased current and future criminal offending (Hampton, Drabick, & Steinberg, 2014).

Because executive function by itself does not appear to be associated with psychopathy (Dolan, 2012; Mol, Van Den Bos, Derks, & Egger, 2009), it may be a more promising moderator of success in psychopathy than intelligence. Indeed, unlike individuals who exhibit high levels of antisocial behavior (Morgan & Lilienfeld, 2000), successful individuals with psychopathy have superior executive functioning compared to controls, and unsuccessful individuals with psychopathy, as assessed by perseverative errors on the Wisconsin Card Sorting Test (Ishikawa et al., 2001; cf. Valliant, Freeston, Pottier, & Kosmyna, 2003). However, given that executive functioning, as measured by the Porteus Maze Test, is not enhanced in participants with subclinical psychopathy (Widom, 1977), the relationship between successful psychopathy and executive functioning may be limited to certain capacities (e.g., flexible responding as opposed to planning) or variable across samples.

### Parenting and Socioeconomic Status

Though influential theories posit that effective parenting is important for engendering success in individuals with psychopathic traits (Lykken, 1995), the empirical evidence for this proposition is mixed. Children with high levels of callous-unemotional traits-which correspond most closely to the affective facet of adult psychopathy-show high levels of conduct problems (Andershed, Gustafson, Kerr, & Stattin, 2002; Wootton, Frick, Shelton, & Silverthorn, 1997) and reactive aggression (Yeh, Chen, Raine, Baker, & Jacobson, 2011), irrespective of the measured adequacy of their parenting. Indeed, the early antisocial behavior of children with callous-unemotional traits appears to account for observed relationships between these traits and poor parenting (Hawes, Dadds, Frost, & Hasking, 2011; Larsson, Viding, Rijsdijk, & Plomin, 2008). Furthermore, poor parenting does not emerge as a robust moderator of the association between psychopathy and offending in adulthood once the trajectory of offending from earlier to later ages is accounted for (Piquero et al., 2012). However, for the interpersonal features of psychopathy, Lykken's original hypothesis may hold: Adolescents high in these features who are exposed to inconsistent parenting show more deviant behavior than those experiencing consistent parenting (Edens, Skopp, & Cahill, 2008).

Less research has examined socioeconomic status (SES) as a moderating factor of success in psychopathy (Flouri, 2008). Specifically, though many studies have examined psychopathy and SES as independent predictors of success versus maladjustment (e.g., Silver, Mulvey, & Monahan, 1999), it is relatively rare to find studies that model the interaction of SES and psychopathy in predicting success. The few existing studies of this type indicate that parental SES does not affect the development of conduct problems in youth with callous-unemotional traits (Barker, Oliver, Viding, Salekin, & Maughan, 2011), nor does it affect recidivism in individuals with psychopathic traits (Walsh & Kosson, 2007). Thus, initial studies of SES as a moderator of success in psychopathy have not yielded positive findings, though it should be noted that these studies have only considered success in terms of reduced maladaptive outcomes associated with the condition.

### Socioecological Niche Filling

Business is considered a prototypical occupational niche that individuals with psychopathy occupy (Pech & Slade, 2007), and data are indicating that psychopathy is associated with some forms of success in business (Smith & Lilienfeld, 2013). Some evidence suggests that individuals with psychopathic traits may effectively suppress at work the malignant behavioral patterns normally ascribed to them in everyday life. After controlling for affiliated traits of Machiavellianism and narcissism, psychopathy is negligibly related to poor job performance and negatively related to counterproductive work behaviors such as corporate theft and abusive management behavior (O'Boyle, Forsyth, Banks, & McDaniel, 2012). Consistent with their agentic orientation, individuals with diagnosable levels of psychopathic traits appear to be overrepresented in management training programs (Babiak, Neumann, & Hare, 2010), though perhaps not in upper management positions (Akin, Amil, & Ozdevecioğlu, 2016). Psychopathy is also positively associated with ratings of communication skills along with creative and innovative thinking, though it shows negative associations with having a good management style and acting as a team player (Babiak et al., 2010). Along similar lines, psychopathy in managers is correlated with increased tenure in business, but it is also associated with increased psychological distress (Mathieu, Babiak, Jones, Neumann, & Hare, 2012), along with reduced job satisfaction and increased work-family conflict on the part of supervisees (Mathieu, Neumann, Hare, & Babiak, 2014).

Other work indicates that psychopathy is associated with maladaptive leadership attributes. Supervisors rated high in psychopathic traits by employees exhibit a *laissez-faire* leadership approach in which employees are left to fend for themselves instead of receiving guidance or correction (Mathieu, Neumann, Babiak, & Hare, 2015). Supervisors' levels of psychopathy are also negatively associated with both transformational (value-based) leadership and transactional (performance-oriented) leadership styles (Mathieu et al., 2015). This pattern is found as well in undergraduate samples (Westerlaken & Woods, 2013), indicating that even though individuals with psychopathic traits are likely to rise within the corporate hierarchy, their leadership styles are predominantly negative. There is evidence that their presence in leadership positions may even encourage bullying in the workplace (Boddy, 2011).

### Physiology and Neuroanatomy

There have been relatively few studies comparing the physiological and neuroanatomical characteristics of successful versus unsuccessful individuals with psychopathic traits. Successful individuals who score high in psychopathy show increased heart rate in anticipation of and during delivery of a speech to others, whereas unsuccessful psychopathic individuals do not (Ishikawa et al., 2001). Additionally, successful psychopathic individuals are more similar to healthy controls in terms of prefrontal cortex gray matter (Yang et al., 2005), along with orbitofrontal cortex and amygdala volume (Yang, Raine, Colletti, Toga, & Narr, 2010), and in terms of symmetry between the left and right anterior hippocampus (Raine et al., 2004). Raine and colleagues (2004) have interpreted the relatively intact autonomic physiology and neuroanatomy of successful individuals as factors protecting such individuals from committing crimes in obvious or easily detectable ways.

### Multiprocess Psychopathy

Contemporary views of psychopathy, in large part influenced by multiprocess accounts, challenge the notion that psychopathy represents a coherent "disorder" in the traditional sense of correlated symptoms indicative of a single "disease" entity (e.g., Lilienfeld, 2013). Instead, they encourage an alternative perspective on psychopathy as a condition that reflects the confluence of different dispositional tendencies. As noted earlier, consistent with this multiprocess perspective, distinct features of psychopathy have been found to show divergent patterns of associations, with external criteria reflecting adaptive and maladaptive functioning (Benning, Patrick, Blonigen, et al., 2005; Blonigen et al., 2010; Hicks & Patrick, 2006; Poythress et al., 2010; Venables & Patrick, 2012; Verona et al., 2001). To account for this fractionation in observed correlates, which spans physiological and behavioral criteria (Patrick & Bernat, 2009), the two-process theory posits that separate mechanisms of weak defensive (fear) reactivity (Benning, Patrick, & Iacono, 2005; Dindo & Fowles, 2011; Vaidyanathan, Hall, Patrick, & Bernat, 2011) and impaired cognitive-executive functioning (Heritage & Benning, 2013; Nelson, Patrick, & Bernat, 2011) contribute to the observable (phenotypic) features of psychopathy. Recent evidence suggests that callous-antagonistic tendencies (Lynam, Miller, & Derefinko, Chapter 11, and Viding & Kimonis, Chapter 7, this volume; see also Benning, 2013), perhaps associated with deficits in affiliative capacity (Patrick et al., 2009), may contribute beyond these other mechanisms.

### The Two-Process Model Perspective on Successful Psychopathy

From the perspective of the two-process model of psychopathy (Fowles & Dindo, 2009; Patrick & Bernat, 2009), weak defensive (fear) reactivity contributes most directly to the interpersonal-affective features of psychopathy, encompassing charm and manipulativeness, grandiosity, and emotional insensitivity in the form of deficient empathic concern, along with nonanxiousness, as described in classic accounts of psychopathy (e.g., Cleckley, 1976). Individuals who exhibit these features without high levels of impulsive-disinhibitory behavior report low levels of anxiety and fear, and exhibit reduced physiological defensive reactivity to fear cues (Patrick, 1994; Patrick & Bernat, 2009). By contrast, the two-process model views boredom susceptibility, impulsiveness, irresponsibility, and nonplanfulness as emanating more directly from deficits in executive functioning that reflect constitutional (genetic) liabilities operating in conjunction with hostile attributional biases (Dodge & Frame, 1982) and experiential factors such as maltreatment during childhood and deviant peer influences (Caspi et al., 2002). Individuals high in these symptoms of psychopathy but lacking in core interpersonal-affective features report high anxiousness and general negative affect and show augmented physiological reactivity to stressors (Patrick, 1994, 2014). In addition to the abundant evidence for contrasting correlates of the two broad factors of psychopathy, support for the notion of separate underlying processes contributing to psychopathy is also provided by research demonstrating distinct subtypes of individuals among those scoring high in overall psychopathy-differentiated in particular by anxiousness (low vs. high) and degree of impulsive-externalizing tendencies (Hicks & Drislane, Chapter 13, this volume).

From the standpoint of the two-process model, successful psychopathy can be seen as the product of a low-fear disposition unaccompanied by significant cognitive–executive dysfunction. Such individuals would be expected to be highly selfconfident, socially assertive, and persuasive, and lacking in sensitivity to the feelings of others due to reduced personal experiences of fear, anxiousness, and distress. Consistent with these suppositions, those high in fearless dominance are more likely to make selfishly profitable decisions in economic games (Yamagishi, Li, Takagishi, Matsumoto, & Kiyonari, 2014); they also have higher incomes (Benning, Patrick, Hicks, Blonigen, & Krueger, 2003) and ranks in financial occupations (Howe, Falkenbach, & Massey, 2014). A compelling illustration of this perspective on successful psychopathy was provided by Lilienfeld, Waldman, and colleagues (2012), who generated estimates of psychopathic features for presidents of the United States, from George Washington through George W. Bush, from personality trait ratings provided by authors of authoritative biographies. Across members of this unique sample, these authors found fearless dominance to be associated with objective markers of presidential performance, leadership skills, public persuasiveness, and crisis management.

Fearless dominance is not uniformly adaptive: It is associated with low empathy (Benning, Patrick, Blonigen, et al., 2005; Mullins-Nelson et al., 2006), adult antisocial behavior (Benning et al., 2003), and nonverbal disciplinary infractions in prison (Patrick, Edens, Poythress, Lilienfeld, & Benning, 2006). Nevertheless, these relatively mild deleterious effects on adaptive functioning would be unlikely to prevent a person from attaining success. In contrast, impulsive antisociality is associated with a host of maladaptive consequences, including child and adult antisocial behavior, problematic substance use, impulsivity and aggressiveness, and other-directed negative emotionality (Benning, Patrick, Blonigen, et al., 2005; Benning, Patrick, Salekin, et al., 2005; Blonigen, Hicks, Krueger, Patrick, & Iacono, 2005; Marcus, Fulton, & Edens, 2013; Patrick et al., 2006; Ross et al., 2009). From a two-process perspective, unsuccessful psychopathy (i.e., expressed as persistent criminal deviance leading to repeated convictions and periods of imprisonment) can be viewed as arising from salient cognitive-executive dysfunction (cf. Moffitt, 1993) and antisocial attitudes alloyed with low dispositional fear. Unsuccessful psychopathy is further likely if an individual experiences adverse events that engender social detachment, distrust, and hostility or even hatred toward others (Christian, Meltzer, Thede, & Kosson, 2017; Lynam, 1996; Patrick et al., 2009).

The two-process view of successful psychopathy as arising from fearlessness per se can be seen as a special case of the subclinical psychopathy model in which a specific process—impulsive antisociality—is lacking or present at only an attenuated level, placing an individual at reduced risk for experiencing a host of maladaptive outcomes. Alternatively, to the extent that fearlessness is conceptualized as peripheral rather than central to psychopathy (Miller & Lynam, 2012; but see Lilienfeld, Patrick, et al., 2012), it may instead be seen as a moderator of the expression of impulsive–antisocial tendencies—with fewer implications for successful versus unsuccessful outcomes. In either case, fearlessness remains an important construct for understanding how individuals with psychopathic traits may channel their underlying proclivities in different phenotypic directions.

### The Triarchic Model Perspective on Successful Psychopathy

There is also accumulating evidence for the validity and heuristic utility of constructs delineated by the triarchic model (for a recent review, see Patrick & Drislane, 2015). The construct of boldness, which relates to the Fearless Dominance factor of the PPI and the broader concept of Dispositional Fear/Fearlessness (Kramer, Patrick, Krueger, & Gasperi, 2012), overlaps to a moderate degree with Factor 1 of the PCL-R (its Interpersonal facet in particular) and differentiates psychopathy from the more prevalent diagnosis of antisocial personality disorder (Venables, Hall, & Patrick, 2014). Furthermore, boldness as assessed in different ways relates to measures of both adaptive (e.g., low negative affect and reduced internalizing psychopathology) and maladaptive psychological functioning (e.g., narcissism and callousness; Patrick & Drislane, 2015; Skeem et al., 2011).

While boldness reflects adaptive tendencies, along with some aspects of maladaptive functioning, the constructs of disinhibition and meanness derive from models of child psychopathy (Frick, Ray, Thornton, & Kahn, 2014) and adult externalizing psychopathology (Krueger, Markon, Patrick, Benning, & Kramer, 2007). Both meanness and disinhibition involve tendencies that are more generally maladaptive. Disinhibition relates strongly to criterion measures indexing impulsivity, negative emotionality, substance use, delinquent/antisocial tendencies, and suicidal behavior (Drislane, Patrick, & Arsal, 2014; Sellbom & Phillips, 2013; Stanley, Wygant, & Sellbom, 2013; Venables et al., 2015; Venables & Patrick, 2012). On the other hand, meanness is preferentially associated with low empathy, low social closeness, instrumental aggression, and antagonism (Drislane, Patrick, Sourander, et al., 2014; Patrick & Drislane, 2015; Sellbom & Phillips, 2013; Stanley et al., 2013).

There are particular socioecological niches in which individuals high in boldness are particularly well suited. In the domain of work and business leadership, ratings of supervisors' boldness are positively associated with subordinates' satisfaction with supervisors and with their jobs; by contrast, meanness and disinhibition are negatively related to these variables (Sanecka, 2013). High levels of boldness have also been found in special military teams assigned to patrol remote regions of Greenland (Kjærgaard, Leon, Venables, & Fink, 2013) and to North Pole expeditions (Leon & Venables, 2015). These studies highlight the potential contribution of high boldness (or dispositional fearlessness) to success in the business world and to effective performance in extreme environments.

Beyond the impact of elevations on individual psychopathy-related dispositions, distinct configurations of psychopathy facets are likely to yield varying degrees of adaptive versus maladaptive outcomes. Whereas high boldness alone is expected to facilitate success in occupations that call for bravery and emotional resilience (e.g., law enforcement, emergency service) or leadership and persuasiveness (e.g., business, politics), individuals high in meanness as well as boldness can be expected to express their social and emotional poise in exploitative-antagonistic ways. An extreme example of this in the business sector was the large-scale Ponzi scheme perpetrated by financier Bernard Madoff, who defrauded unsuspecting investors out of billions of dollars. Boldness in conjunction with high disinhibition, on the other hand, could be expected to present in a manner more consistent with Cleckley's conception of psychopathy as a "masked" pathology: An individual of this type would be expected to appear emotionally well adjusted and socially adept but act out in reckless, irresponsible ways to gratify immediate desires, without regard for adverse consequences. In contrast with this, disinhibition coupled with high meanness would be expected to manifest as severely aggressive externalizing behavior, ranging from use of psychological pressure or physical force to achieve selfish goals to sadistic acts of violence.

### Synthesis of Evidence for Models of Successful Psychopathy

We have argued that successful psychopathy may be conceptualized in terms of achievement in one or more visible spheres of activity without salient maladaptive outcomes (e.g., criminal convictions, other debilitating externalizing problems) in individuals scoring high in psychopathic tendencies. Empirical research points to some specific characteristics associated with success in high-psychopathic individuals. These include increased age, higher executive functioning, and physiological and neuroanatomical similarity to healthy controls. Individuals with psychopathic tendencies are found at elevated rates in business settings; though exhibiting success on some parameters of job performance, their leadership styles tend to be viewed as problematic by subordinates. Neither parenting nor SES appear to moderate the relationship between psychopathy and offending.

Whether termed "fearless dominance," "boldness," or "weak defensive reactivity," dispositional fearlessness in itself appears to be associated with a range of adaptive tendencies, as well as with certain deviant tendencies readily recognizable as psychopathic (e.g., narcissism, risk taking). As such, the presence of dispositional fearlessness in the absence of neurocognitive liability for externalizing problems is perhaps the clearest basis for successful psychopathy. Other combinations of bold, mean-callous, and disinhibitory tendencies may also be associated with successful, noncriminal outcomes-but further systematic research is needed to evaluate the ways in which these differing configurations of psychopathic attributes are expressed.

### Unresolved Questions and Directions for Future Research

Despite progress that has been made to date in understanding successful psychopathy, a number of questions remain in considering how successful psychopathy relates to and differs from unsuccessful psychopathy. We discuss four of the most important of these questions and consider their implications for future research on successful psychopathy.

1. How should psychopathy be defined to study its successful expressions? The answer to this question determines how to interpret the results of studies to be undertaken in the future. For example, to the extent that dispositional fearlessness or boldness is viewed as peripheral to psychopathy (Miller & Lynam, 2012), findings from multiprocess-oriented studies would be interpreted in the framework of

the moderated model of successful psychopathy. Specifically, fearlessness would be treated as a moderator of success in psychopathy rather than a core component of psychopathy that may drive individuals toward success (Lilienfeld, Patrick, et al., 2012). Furthermore, those who believe that successful subclinical psychopathy should be defined in a complex manner (Gustafson & Ritzer, 1995) may be unsatisfied with the relatively simple model of success in subclinical psychopathy proposed in this review.

2. Why do researchers frequently fail to report descriptive statistics for assessment measures to allow comparisons between clinical and subclinical psychopathy? Overall, the correlates of psychopathic traits in clinical and nonclinical samples are remarkably similar. However, it has proven more difficult to compare mean levels of psychopathy, personality, externalizing behavior, and laboratory performance measures across study samples containing more versus less successful individuals with psychopathic traits. One of the most striking omissions we encountered in reviewing pertinent studies (including our own!) was a dearth of basic descriptive statistics (e.g., means, standard deviations, ranges) for measures that were used in studies of psychopathy in both incarcerated and nonincarcerated samples. This lack of information precludes mean-level comparisons of subclinical and clinical populations in many cases. Two approaches to remedying this problem would be to routinely report descriptive statistics in tables (e.g., Hicklin & Widiger, 2005 vs. Ross et al., 2009), or in the main text of research articles (e.g., Hunter et al., 2005 vs. Swogger, Walsh, Houston, Cashman-Brown, & Conner, 2010). Our recommendation is that researchers utilize the first two columns or last two rows in a typical lower triangular matrix of correlations to report means and standard deviations for measures administered in a study. This procedure would allow evaluation of how successful and unsuccessful individuals with psychopathic traits compare across different samples in terms of mean scores on psychopathy-related measures and their associations with various criterion variables. It would also allow more effective integration of data across studies involving different populations for purposes of investigating successful psychopathy.

3. How can our knowledge of moderators of successful psychopathy be advanced? Aside from studies by Raine and colleagues (2004), most existing research on variables affecting success in psychopathic individuals has been conducted in incarcerated samples. Thus, there is a critical need for further work with community samples investigating what factors shape psychopathic tendencies in adaptive versus nonadaptive directions. One basis for work of this type is to conduct secondary analyses using existing datasets that contain psychopathy scores along with measures of moderators such as age, intelligence, or SES (e.g., Silver et al., 1999). Specifically, within such datasets, mean-centered interaction terms (Dalal & Zickar, 2012) for candidate moderators with psychopathy scores can be included in regression models to evaluate their impact on the relationship between psychopathy and success.

4. What kinds of maladaptive outcomes remain underresearched in psychopathy? History of incarceration is by far the most common referent used to distinguish successful from unsuccessful psychopathy in research studies. However, psychopathic traits may influence numerous other lifecourse outcomes, including income and resource accumulation (Mincer, 1958), maintenance versus dissolution of romantic relationships (Jonason & Kavanagh, 2010), and preservation across time of friendships and familial relations (Martens, 2014). These kinds of outcomes are more challenging to quantify than simply designating whether or not a person is incarcerated. Nevertheless, they are critical to consider in investigating how psychopathy affects adaptation as a whole throughout a person's lifetime.

### REFERENCES

- Aharoni, E., & Kiehl, K. A. (2013). Evading justice: Quantifying criminal success in incarcerated psychopathic offenders. Criminal Justice and Behavior, 40(6), 629–645.
- Akhtar, R., Ahmetoglu, G., & Chamorro-Premuzic, T. (2013). Greed is good?: Assessing the relationship between entrepreneurship and subclinical psychopathy. *Personality and Individual Differences*, 54(3), 420–425.
- Akin, M., Amil, O., & Özdevecioğlu, M. (2016). Is your manager a psychopath?: An evaluation of the relationship between the personality types of managers and workers and the levels of psychopathy. Procedia—Social and Behavioral Sciences, 221, 76–85.
- Ali, F., & Chamorro-Premuzic, T. (2010). The dark side of love and life satisfaction: Associations with intimate relationships, psychopathy and Machiavellianism. *Personality and Individual Differences*, 48(2), 228–233.
- Allen, J. L., Briskman, J., Humayun, S., Dadds, M. R., &

Scott, S. (2013). Heartless and cunning?: Intelligence in adolescents with antisocial behavior and psychopathic traits. *Psychiatry Research*, 210(3), 1147–1153.

- Andershed, H., Gustafson, S. B., Kerr, M., & Stattin, H. (2002). The usefulness of self-reported psychopathylike traits in the study of antisocial behaviour among non-referred adolescents. *European Journal of Personality*, 16(5), 383–402.
- Babiak, P. (1995). When psychopaths go to work: A case study of an industrial psychopath. *Applied Psychology*, 44(2), 171–188.
- Babiak, P., & Hare, R. D. (2006). Snakes in suits: When psychopaths go to work. New York: HarperCollins.
- Babiak, P., Neumann, C. S., & Hare, R. D. (2010). Corporate psychopathy: Talking the walk. Behavioral Sciences and the Law, 28(2), 174–193.
- Bagshaw, R., Gray, N. S., & Snowden, R. J. (2014). Executive function in psychopathy: The Tower of London, Brixton Spatial Anticipation and the Hayling Sentence Completion Tests. *Psychiatry Research*, 220(1–2), 483–489.
- Bailey, C. D. (2015). Psychopathy, academic accountants' attitudes toward unethical research practices, and publication success. Accounting Review, 90(4), 1307–1332.
- Barker, E. D., Oliver, B. R., Viding, E., Salekin, R. T., & Maughan, B. (2011). The impact of prenatal maternal risk, fearless temperament and early parenting on adolescent callous–unemotional traits: A 14-year longitudinal investigation. *Journal of Child Psychol*ogy and Psychiatry, 52(8), 878–888.
- Beggs, S. M., & Grace, R. C. (2008). Psychopathy, intelligence, and recidivism in child molesters: Evidence of an interaction effect. *Criminal Justice and Behavior*, 35(6), 683–695.
- Belfort, J. (2007). The wolf of Wall Street. New York: Bantam.
- Belmore, M. F., & Quinsey, V. L. (1994). Correlates of psychopathy in a noninstitutional sample. *Journal of Interpersonal Violence*, 9(3), 339–349.
- Benning, S. D. (2013). Heterogeneity in content and psychopathies: Comment on Marcus et al. Personality Disorders, 4(1), 83–84.
- Benning, S. D., Molina, S. M., Dowgwillo, E. A., Patrick, C. J., Miller, K. F., & Storrow, A. B. (in press). Psychopathy in the medical emergency department. *Journal of Personality Disorders.*
- Benning, S. D., Patrick, C. J., Blonigen, D. M., Hicks, B. M., & Iacono, W. G. (2005). Estimating facets of psychopathy from normal personality traits: A step toward community epidemiological investigations. *Assessment*, 12(1), 3–18.
- Benning, S. D., Patrick, C. J., Hicks, B. M., Blonigen, D. M., & Krueger, R. F. (2003). Factor structure of the psychopathic personality inventory: Validity and implications for clinical assessment. *Psychological As*sessment, 15(3), 340–350.
- Benning, S. D., Patrick, C. J., & Iacono, W. G. (2005). Psychopathy, startle blink modulation, and elec-

trodermal reactivity in twin men. *Psychophysiology*, 42(6), 753–762.

- Benning, S. D., Patrick, C. J., Salekin, R. T., & Leistico, A.-M. R. (2005). Convergent and discriminant validity of psychopathy factors assessed via self-report: A comparison of three instruments. Assessment, 12(3), 270–289.
- Blair, R. J. R. (2008). Fine cuts of empathy and the amygdala: Dissociable deficits in psychopathy and autism. *Quarterly Journal of Experimental Psychology*, 61(1), 157–170.
- Blonigen, D. M., Hicks, B. M., Krueger, R. F., Patrick, C. J., & Iacono, W. G. (2005). Psychopathic personality traits: Heritability and genetic overlap with internalizing and externalizing psychopathology. *Psychological Medicine*, 35(5), 637–648.
- Blonigen, D. M., Hicks, B. M., Krueger, R. F., Patrick, C. J., & Iacono, W. G. (2006). Continuity and change in psychopathic traits as measured via normal-range personality: A longitudinal-biometric study. *Journal* of Abnormal Psychology, 115(1), 85–95.
- Blonigen, D. M., Patrick, C. J., Douglas, K. S., Poythress, N. G., Skeem, J. L., Lilienfeld, S. O., et al. (2010). Multimethod assessment of psychopathy in relation to factors of internalizing and externalizing from the Personality Assessment Inventory: The impact of method variance and suppressor effects. *Psychological Assessment*, 22(1), 96–107.
- Boddy, C. R. (2011). Corporate psychopaths, bullying and unfair supervision in the workplace. *Journal of Business Ethics*, 100(3), 367–379.
- Boddy, C. R. P., Ladyshewsky, R., & Galvin, P. (2010). Leaders without ethics in global business: Corporate psychopaths. *Journal of Public Affairs*, 10(3), 121–138.
- Brown, S. D., Lent, R. W., Telander, K., & Tramayne, S. (2011). Social cognitive career theory, conscientiousness, and work performance: A meta-analytic path analysis. *Journal of Vocational Behavior*, 79(1), 81–90.
- Buckels, E. E., Jones, D. N., & Paulhus, D. L. (2013). Behavioral confirmation of everyday sadism. *Psychological Science*, 24(11), 2201–2209.
- Buckels, E. E., Trapnell, P. D., & Paulhus, D. L. (2014). Trolls just want to have fun. Personality and Individual Differences, 67, 97–102.
- Caspi, A., McClay, J., Moffitt, T. E., Mill, J., Martin, J., Craig, I. W., et al. (2002). Role of genotype in the cycle of violence in maltreated children. *Science*, 297, 851–854.
- Chiaburu, D. S., Muñoz, G. J., & Gardner, R. G. (2013). How to spot a careerist early on: Psychopathy and exchange ideology as predictors of careerism. *Journal* of Business Ethics, 118(3), 473–486.
- Christian, E. J., Meltzer, C. L., Thede, L. L., & Kosson, D. S. (2017). The relationship between early life events, parental attachment, and psychopathic tendencies in adolescent detainees. *Child Psychiatry and Human Development*, 48(2), 260–269.
- Cima, M., & Raine, A. (2009). Distinct characteristics of psychopathy relate to different subtypes of aggres-

sion. Personality and Individual Differences, 47(8), 835–840.

- Cleckley, H. (1976). The mask of sanity (5th ed.). St. Louis, MO: Mosby.
- Coid, J., Yang, M., Ullrich, S., Roberts, A., & Hare, R. D. (2009). Prevalence and correlates of psychopathic traits in the household population of Great Britain. *International Journal of Law and Psychiatry*, 32(2), 65–73.
- Coppola, F. F. (Director). (1972). *The Godfather* [Motion picture]. Los Angeles: Paramount Pictures.
- Dalal, D. K., & Zickar, M. J. (2012). Some common myths about centering predictor variables in moderated multiple regression and polynomial regression. *Organizational Research Methods*, 15(3), 339–362.
- DeMatteo, D., Heilbrun, K., & Marczyk, G. (2006). An empirical investigation of psychopathy in a noninstitutionalized and noncriminal sample. Behavioral Sciences and the Law, 24(2), 133–146.
- Dindo, L., & Fowles, D. (2011). Dual temperamental risk factors for psychopathic personality: Evidence from self-report and skin conductance. *Journal of Per*sonality and Social Psychology, 100(3), 557–566.
- Dodge, K. A., & Frame, C. L. (1982). Social cognitive biases and deficits in aggressive boys. *Child Development*, 53(3), 620–635.
- Dolan, M. (2012). The neuropsychology of prefrontal function in antisocial personality disordered offenders with varying degrees of psychopathy. *Psychological Medicine*, 42(8), 1715–1725.
- Drislane, L. E., & Patrick, C. J. (2017). Integrating alternative conceptions of psychopathic personality: A latent variable model of Triarchic psychopathy constructs. *Journal of Personality Disorders*, 31(1), 110–132.
- Drislane, L. E., Patrick, C. J., & Arsal, G. (2014). Clarifying the content coverage of differing psychopathy inventories through reference to the triarchic psychopathy measure. *Psychological Assessment*, 26(2), 350–362.
- Drislane, L. E., Patrick, C. J., Sourander, A., Sillanmäki, L., Aggen, S. H., Elonheimo, H., et al. (2014). Distinct variants of extreme psychopathic individuals in society at large: Evidence from a population-based sample. *Personality Disorders*, 5(2), 154–163.
- Edens, J. F., Skopp, N. A., & Cahill, M. A. (2008). Psychopathic features moderate the relationship between harsh and inconsistent parental discipline and adolescent antisocial behavior. *Journal of Clinical Child and Adolescent Psychology*, 37(2), 472–476.
- Fallon, J. (2013). The psychopath inside: A neuroscientist's personal journey into the dark side of the brain. New York: Current.
- Flouri, E. (2008). Temperament influences on parenting and child psychopathology: Socio-economic disadvantage as moderator. Child Psychiatry and Human Development, 39(4), 369–379.
- Flynn, G. (2012). Gone girl. New York: Crown.
- Fowles, D. C., & Dindo, L. (2009). Temperament and

psychopathy: A dual-pathway model. Current Directions in Psychological Science, 18(3), 179–183.

- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014). Can callous–unemotional traits enhance the understanding, diagnosis, and treatment of serious conduct problems in children and adolescents?: A comprehensive review. *Psychological Bulletin*, 140(1), 1–57.
- Gao, Y., & Raine, A. (2010). Successful and unsuccessful psychopaths: A neurobiological model. *Behavioral Sciences and the Law*, 28(2), 194–210.
- Gao, Y., Raine, A., & Schug, R. A. (2011). P3 eventrelated potentials and childhood maltreatment in successful and unsuccessful psychopaths. Brain and Cognition, 77(2), 176–182.
- Gaughan, E. T., Miller, J. D., Pryor, L. R., & Lynam, D. R. (2009). Comparing two alternative measures of general personality in the assessment of psychopathy: A test of the NEO PI-R and the MPQ. Journal of Personality, 77(4), 965–996.
- Gervais, M. M., Kline, M., Ludmer, M., George, R., & Manson, J. H. (2013). The strategy of psychopathy: Primary psychopathic traits predict defection on lowvalue relationships. *Proceedings of the Royal Society B: Biological Sciences*, 280(1757), 20122773.
- Gilligan, V., Moore, K., Porter, D., Cranston, B., Gunn, A., Mitte, R. J., et al. (2009). Breaking Bad: The complete first season [Televison series]. Culver City, CA: Sony Pictures Home Entertainment.
- Gladden, P. R., Figueredo, A. J., & Jacobs, W. J. (2009). Life history strategy, psychopathic attitudes, personality, and general intelligence. *Personality and Indi*vidual Differences, 46(3), 270–275.
- Glenn, A. L., Kurzban, R., & Raine, A. (2011). Evolutionary theory and psychopathy. Aggression and Violent Behavior, 16(5), 371–380.
- Grandin, T. (2010). Thinking in pictures: My life with autism (2nd ed.). New York: Vintage Books.
- Grandin, T. (2012). Different . . . not less: Inspiring stories of achievement and successful employment from individuals with autism, Asperger's, and ADHD. Arlington, TX: Future Horizons.
- Guay, J.-P., Ruscio, J., Knight, R. A., & Hare, R. D. (2007). A taxometric analysis of the latent structure of psychopathy: Evidence for dimensionality. *Journal* of Abnormal Psychology, 116(4), 701–716.
- Gustafson, S. B., & Ritzer, D. R. (1995). The dark side of normal: A psychopathy-linked pattern called aberrant self-promotion. *European Journal of Personality*, 9(3), 147–183.
- Hall, J. R., Benning, S. D., & Patrick, C. J. (2004). Criterion-related validity of the three-factor model of psychopathy: Personality, behavior, and adaptive functioning. Assessment, 11(1), 4–16.
- Hampton, A. S., Drabick, D. A. G., & Steinberg, L. (2014). Does IQ moderate the relation between psychopathy and juvenile offending? *Law and Human Behavior*, 38(1), 23–33.

- Hare, R. D. (1985). Comparison of procedures for the assessment of psychopathy. *Journal of Consulting and Clinical Psychology*, 53(1), 7–16.
- Hare, R. D. (2003). The Hare Psychopathy Checklist— Revised (2nd ed.). Toronto: Multi-Health Systems.
- Hare, R. D., & Neumann, C. S. (2008). Psychopathy as a clinical and empirical construct. Annual Review of Clinical Psychology, 4, 217–246.
- Hare, R. D., & Neumann, C. S. (2010). The role of antisociality in the psychopathy construct: Comment on Skeem and Cooke (2010). *Psychological Assessment*, 22(2), 446–454.
- Harris, G. T., Rice, M. E., Hilton, N. Z., Lalumiére, M. L., & Quinsey, V. L. (2007). Coercive and precocious sexuality as a fundamental aspect of psychopathy. *Journal of Personality Disorders*, 21(1), 1–27.
- Hart, S. D., Cox, D. N., & Hare, R. D. (1995). The Psychopathy Checklist: Screening Version. Toronto: Multi-Health Systems.
- Hawes, D. J., Dadds, M. R., Frost, A. D. J., & Hasking, P. A. (2011). Do childhood callous–unemotional traits drive change in parenting practices? *Journal of Clini*cal Child and Adolescent Psychology, 40(4), 507–518.
- Hecht, L. K., Berg, J. M., Lilienfeld, S. O., & Latzman, R. D. (2016). Parsing the heterogeneity of psychopathy and aggression: Differential associations across dimensions and gender. *Personality Disorders*, 7(1), 2–14.
- Heilbrun, A. B. (1979). Psychopathy and violent crime. Journal of Consulting and Clinical Psychology, 47(3), 509–516.
- Heilbrun, A. B., & Heilbrun, M. R. (1985). Psychopathy and dangerousness: Comparison, integration and extension of two psychopathic typologies. *British Jour*nal of Clinical Psychology, 24(3), 181–195.
- Heritage, A. J., & Benning, S. D. (2013). Impulsivity and response modulation deficits in psychopathy: Eevidence from the ERN and N1. *Journal of Abnormal Psychology*, 122(1), 215–222.
- Hicklin, J., & Widiger, T. A. (2005). Similarities and differences among antisocial and psychopathic selfreport inventories from the perspective of general personality functioning. *European Journal of Personality*, 19(4), 325–342.
- Hicks, B. M., & Patrick, C. J. (2006). Psychopathy and negative emotionality: Analyses of suppressor effects reveal distinct relations with emotional distress, fearfulness, and anger-hostility. *Journal of Abnormal Psychology*, 115(2), 276–287.
- Hirschi, T., & Gottfredson, M. (1983). Age and the explanation of crime. American Journal of Sociology, 89(3), 552–584.
- Hirschi, T., & Hindelang, M. J. (1977). Intelligence and delinquency: A revisionist review. American Sociological Review, 42(4), 571–587.
- Holland, T. R., Beckett, G. E., & Levi, M. (1981). Intelligence, personality, and criminal violence: A multivariate analysis. *Journal of Consulting and Clinical Psychology*, 49(1), 106–111.

- Howe, J., Falkenbach, D., & Massey, C. (2014). The relationship among psychopathy, emotional intelligence, and professional success in finance. *International Journal of Forensic Mental Health*, 13(4), 337–347.
- Hughes, M. A., Dolan, M. C., Trueblood, J. S., & Stout, J. C. (2015). Psychopathic personality traits and Iowa Gambling Task performance in incarcerated offenders. *Psychiatry*, *Psychology and Law*, 22(1), 134–144.
- Hunt, M. K., Hopko, D. R., Bare, R., Lejuez, C. W., & Robinson, E. V. (2005). Construct validity of the Balloon Analog Risk Task (BART): Associations with psychopathy and impulsivity. Assessment, 12(4), 416–428.
- Hunter, E. E., Penick, E. C., Powell, B. J., Othmer, E., Nickel, E. J., & Desouza, C. (2005). Development of scales to screen for eight common psychiatric disorders. *Journal of Nervous and Mental Disease*, 193(2), 131–135.
- Ishikawa, S. S., Raine, A., Lencz, T., Bihrle, S., & Lacasse, L. (2001). Autonomic stress reactivity and executive functions in successful and unsuccessful criminal psychopaths from the community. *Journal* of Abnormal Psychology, 110(3), 423–432.
- Jakobwitz, S., & Egan, V. (2006). The dark triad and normal personality traits. *Personality and Individual Differences*, 40(2), 331–339.
- Jamison, K. R. (1993). Touched with fire: Manic-depressive illness and the artistic temperament. New York: Simon & Schuster.
- Jamison, K. R. (1995). An unquiet mind: A memoir of moods and madness. New York: Vintage Books.
- Johansson, P., & Kerr, M. (2005). Psychopathy and intelligence: A second look. *Journal of Personality Dis*orders, 19(4), 357–369.
- Jonason, P. K., & Kavanagh, P. (2010). The dark side of love: Love styles and the Dark Triad. Personality and Individual Differences, 49(6), 606–610.
- Jonason, P. K., Li, N. P., & Buss, D. M. (2010). The costs and benefits of the Dark Triad: Implications for mate poaching and mate retention tactics. *Personality and Individual Differences*, 48(4), 373–378.
- Jonason, P. K., Li, N. P., Webster, G. D., & Schmitt, D. P. (2009). The dark triad: Facilitating a short-term mating strategy in men. European Journal of Personality, 23(1), 5–18.
- Jonason, P. K., & Schmitt, D. P. (2012). What have you done for me lately?: Friendship-selection in the shadow of the Dark Triad traits. *Evolutionary Psychology*, 10(3), 400–421.
- Jonason, P. K., Valentine, K. A., Li, N. P., & Harbeson, C. L. (2011). Mate-selection and the Dark Triad: Facilitating a short-term mating strategy and creating a volatile environment. *Personality and Individual Differences*, 51(6), 759–763.
- Jonason, P. K., Wee, S., Li, N. P., & Jackson, C. (2014). Occupational niches and the Dark Triad traits. Personality and Individual Differences, 69, 119–123.

- Jones, D. N. (2014). Risk in the face of retribution: Psychopathic individuals persist in financial misbehavior among the Dark Triad. *Personality and Individual Differences*, 67, 109–113.
- Jones, D. N., & Paulhus, D. L. (2010). Different provocations trigger aggression in narcissists and psychopaths. Social Psychological and Personality Science, 1(1), 12–18.
- Kapinos, T. (Writer/Producer). (2007). Californication [Television series]. United States: Showtime.
- Karpman, B. (1941). On the need of separating psychopathy into two distinct clinical types: The symptomatic and the idiopathic. *Journal of Criminal Psychopathology*, 3, 112–137.
- Kiehl, K., & Lushing, J. (2014). Psychopathy. Scholarpedia, 9(5), 30835.
- Kinner, S. (2003). Psychopathy as an adaptation: Implications for society and social policy. In R. W. Bloom & N. Dess (Eds.), Evolutionary psychology and violence: A primer for policymakers and public policy advocates (pp. 57–81). Westport, CT: Praeger.
- Kjærgaard, A., Leon, G. R., Venables, N. C., & Fink, B. A. (2013). Personality, personal values and growth in military special unit patrol teams operating in a polar environment. *Military Psychology*, 25(1), 13–22.
- Kramer, M. D., Patrick, C. J., Krueger, R. F., & Gasperi, M. (2012). Delineating physiological defensive reactivity in the domain of self-report: Phenotypic and etiologic structure of dispositional fear. *Psychological Medicine*, 42, 1305–1320.
- Krueger, R. F., Markon, K. E., Patrick, C. J., Benning, S. D., & Kramer, M. D. (2007). Linking antisocial behavior, substance use, and personality: An integrative quantitative model of the adult externalizing spectrum. Journal of Abnormal Psychology, 116(4), 645–666.
- Larsson, H., Viding, E., Rijsdijk, F. V., & Plomin, R. (2008). Relationships between parental negativity and childhood antisocial behavior over time: A bidirectional effects model in a longitudinal genetically informative design. *Journal of Abnormal Child Psychology*, 36(5), 633–645.
- Lejuez, C. W., Read, J. P., Kahler, C. W., Richards, J. B., Ramsey, S. E., Stuart, G. L., et al. (2002). Evaluation of a behavioral measure of risk taking: The Balloon Analogue Risk Task (BART). *Journal of Experimental Psychology: Applied*, 8(2), 75–84.
- Leon, G. R., & Venables, N. C. (2015). Fearless temperament and overconfidence in an unsuccessful special forces polar expedition. Aerospace Medicine and Human Performance, 86(6), 567–570.
- Lilienfeld, S. O. (1994). Conceptual problems in the assessment of psychopathy. *Clinical Psychology Review*, 14(1), 17–38.
- Lilienfeld, S. O. (1998). Methodological advances and developments in the assessment of psychopathy. *Behaviour Research and Therapy*, 36(1), 99–125.
- Lilienfeld, S. O. (2013). Is psychopathy a syndrome?:

Commentary on Marcus, Fulton, and Edens. Personality Disorders, 4(1), 85–86.

- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment*, 66, 488–524.
- Lilienfeld, S. O., Latzman, R. D., Watts, A. L., Smith, S., & Dutton, K. (2014). Correlates of psychopathic personality traits in everyday life: Results from a large community survey. *Frontiers in Psychology*, 5, 740.
- Lilienfeld, S. O., Patrick, C. J., Benning, S. D., Berg, J., Sellbom, M., & Edens, J. F. (2012). The role of fearless dominance in psychopathy: Confusions, controversies, and clarifications. *Personality Disorders*, 3(3), 327–340.
- Lilienfeld, S. O., Waldman, I. D., Landfield, K., Watts, A. L., Rubenzer, S., & Faschingbauer, T. R. (2012). Fearless dominance and the U.S. presidency: Implications of psychopathic personality traits for successful and unsuccessful political leadership. *Journal of Personality and Social Psychology*, 103(3), 489–505.
- Lilienfeld, S. O., Watts, A. L., & Smith, S. F. (2015). Successful psychopathy: A scientific status report. *Current Directions in Psychological Science*, 24(4), 298–303.
- Lilienfeld, S. O., & Widows, M. (2005). Manual for the Psychopathic Personality Inventory—Revised (PPI-R). Lutz, FL: Psychological Assessment Resources.
- Lotze, M., Veit, R., Anders, S., & Birbaumer, N. (2007). Evidence for a different role of the ventral and dorsal medial prefrontal cortex for social reactive aggression: An interactive fMRI study. *NeuroImage*, 34(1), 470–478.
- Lykken, D. T. (1957). A study of anxiety in the sociopathic personality. *Journal of Abnormal Psychology*, 55(1), 6–10.
- Lykken, D. T. (1995). The antisocial personalities. Hillsdale, NJ: Erlbaum.
- Lynam, D. R. (1996). Early identification of chronic offenders: Who is the fledgling psychopath? *Psychological Bulletin*, 120(2), 209–234.
- Lynam, D. R., Gaughan, E. T., Miller, J. D., Miller, D. J., Mullins-Sweatt, S., & Widiger, T. A. (2011). Assessing the basic traits associated with psychopathy: Development and validation of the Elemental Psychopathy Assessment. *Psychological Assessment*, 23(1), 108–124.
- Lynam, D. R., & Miller, J. D. (2012). Fearless dominance and psychopathy: A response to Lilienfeld et al. Personality Disorders, 3(3), 341–353.
- Lynam, D. R., Whiteside, S., & Jones, S. (1999). Selfreported psychopathy: A validation study. *Journal of Personality Assessment*, 73(1), 110–132.
- Lynam, D. R., & Widiger, T. A. (2007). Using a general model of personality to identify the basic elements of psychopathy. *Journal of Personality Disorders*, 21(2), 160–178.

- Mahmut, M. K., Homewood, J., & Stevenson, R. J. (2008). The characteristics of non-criminals with high psychopathy traits: Are they similar to criminal psychopaths? *Journal of Research in Personality*, 42(3), 679–692.
- Marcus, D. K., Fulton, J. J., & Edens, J. F. (2013). The two-factor model of psychopathic personality: Evidence from the psychopathic personality inventory. *Personality Disorders*, 4(1), 67–76.
- Marcus, D. K., John, S. L., & Edens, J. F. (2004). A taxometric analysis of psychopathic personality. *Journal* of Abnormal Psychology, 113(4), 626–635.
- Martens, W. J. H. (2014, October 7). The hidden suffering of the psychopath. Psychiatric Times. Retrieved July 31, 2016, from www.psychiatrictimes.com/psychotic-affective-disorders/hidden-suffering-psychopath.
- Mathieu, C., Babiak, P., Jones, D. N., Neumann, C., & Hare, R. D. (2012). What are the effects of psychopathic traits in a supervisor on employees' psychological distress? *Journal of Organizational Culture*, *Communication and Conflict*, 16(2), 81–84.
- Mathieu, C., Neumann, C., Babiak, P., & Hare, R. D. (2015). Corporate psychopathy and the full-range leadership model. Assessment, 22(3), 267–278.
- Mathieu, C., Neumann, C. S., Hare, R. D., & Babiak, P. (2014). A dark side of leadership: Corporate psychopathy and its influence on employee well-being and job satisfaction. *Personality and Individual Differences*, 59, 83–88.
- McCord, W., & McCord, J. (1964). The psychopath: An essay on the criminal mind. Oxford, UK: Van Nostrand.
- Mealey, L. (1995). The sociobiology of sociopathy: An integrated evolutionary model. *Behavioral and Brain Sciences*, 18(3), 523–541.
- Miller, J. D., Jones, S. E., & Lynam, D. R. (2011). Psychopathic traits from the perspective of self and informant reports: Is there evidence for a lack of insight? *Journal of Abnormal Psychology*, 120(3), 758–764.
- Miller, J. D., & Lynam, D. R. (2012). An examination of the Psychopathic Personality Inventory's nomological network: A meta-analytic review. *Personality Disorders*, 3(3), 305–326.
- Miller, J. D., Lynam, D. R., Widiger, T. A., & Leukefeld, C. (2001). Personality disorders as extreme variants of common personality dimensions: Can the five factor model adequately represent psychopathy? *Journal* of *Personality*, 69(2), 253–276.
- Mincer, J. (1958). Investment in human capital and personal income distribution. *Journal of Political Econo*my, 66(4), 281–302.
- Mitchell, D. G. V., Colledge, E., Leonard, A., & Blair, R. J. R. (2002). Risky decisions and response reversal: Is there evidence of orbitofrontal cortex dysfunction in psychopathic individuals? *Neuropsychologia*, 40(12), 2013–2022.
- Moffitt, T. E. (1993). Adolescence-limited and lifecourse-persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, 100(4), 674–701.

- Mol, B., Van Den Bos, P., Derks, Y., & Egger, J. (2009). Executive functioning and the two-factor model of psychopathy: No differential relation? *International Journal of Neuroscience*, 119(1), 124–140.
- Morgan, A. B., & Lilienfeld, S. O. (2000). A meta-analytic review of the relation between antisocial behavior and neuropsychological measures of executive function. Clinical Psychology Review, 20(1), 113–136.
- Mullins-Nelson, J. L., Salekin, R. T., & Leistico, A.-M. R. (2006). Psychopathy, empathy, and perspectivetaking ability in a community sample: Implications for the successful psychopathy concept. *International Journal of Forensic Mental Health*, 5(2), 133–149.
- Mullins-Sweatt, S. N., Glover, N. G., Derefinko, K. J., Miller, J. D., & Widiger, T. A. (2010). The search for the successful psychopath. *Journal of Research in Per*sonality, 44(4), 554–558.
- Muñoz, L. C., Khan, R., & Cordwell, L. (2011). Sexually coercive tactics used by university students: A clear role for primary psychopathy. *Journal of Personality Disorders*, 25(1), 28–40.
- Murrie, D. C., Marcus, D. K., Douglas, K. S., Lee, Z., Salekin, R. T., & Vincent, G. (2007). Youth with psychopathy features are not a discrete class: A taxometric analysis. *Journal of Child Psychology and Psychiatry* and Allied Disciplines, 48(7), 714–723.
- Nadelhoffer, T., & Sinnott-Armstrong, W. P. (2010). Is psychopathy a mental disease? In N. A. Vincent (Ed.), Neuroscience and legal responsibility (pp. 229– 255). New York: Oxford University Press.
- Nathanson, C., Paulhus, D. L., & Williams, K. M. (2006a). Personality and misconduct correlates of body modification and other cultural deviance markers. Journal of Research in Personality, 40(5), 779–802.
- Nathanson, C., Paulhus, D. L., & Williams, K. M. (2006b). Predictors of a behavioral measure of scholastic cheating: Personality and competence but not demographics. Contemporary Educational Psychology, 31(1), 97–122.
- Nazar, S. (1998). A beautiful mind. New York: Touchstone.
- Nelson, L. D., Patrick, C. J., & Bernat, E. M. (2011). Operationalizing proneness to externalizing psychopathology as a multivariate psychophysiological phenotype. *Psychophysiology*, 48(1), 64–72.
- Neumann, C. S., Hare, R. D., & Newman, J. P. (2007). The super-ordinate nature of the Psychopathy Checklist-Revised. Journal of Personality Disorders, 21(2), 102–117.
- Newman, J. P., Widom, C. S., & Nathan, S. (1985). Passive avoidance in syndromes of disinhibition: Psychopathy and extraversion. *Journal of Personality and Social Psychology*, 48(5), 1316–1327.
- O'Boyle, E. H., Forsyth, D. R., Banks, G. C., & McDaniel, M. A. (2012). A meta-analysis of the Dark Triad and work behavior: A social exchange perspective. *Journal of Applied Psychology*, 97(3), 557–579.
- Olver, M. E., & Wong, S. C. P. (2015). Short- and long-

term recidivism prediction of the PCL-R and the effects of age: A 24-year follow-up. *Personality Disorders*, 6(1), 97–105.

- Parker, B., & Chusmir, L. H. (1992). Development and validation of a life-success measures scale. *Psychological Reports*, 70(2), 627–637.
- Patrick, C. J. (1994). Emotion and psychopathy: Startling new insights. Psychophysiology, 31(4), 319–330.
- Patrick, C. J. (2007). Getting to the heart of psychopathy. In H. Hervé & J. C. Yuille (Eds.), *The psychopath: Theory, research, and social implications.* Hillsdale, NJ: Erlbaum.
- Patrick, C. J. (2014). Physiological correlates of psychopathy, antisocial personality disorder, habitual aggression, and violence. Current Topics in Behavioral Neurosciences, 21, 197–227.
- Patrick, C. J., & Bernat, E. M. (2009). Neurobiology of psychopathy: A two-process theory. In G. G. Berntson & J. T. Cacioppo (Eds.), *Handbook of neuroscience for the behavioral sciences* (Vol. 2, pp. 1110–1131). New York: Wiley.
- Patrick, C. J., & Drislane, L. E. (2015). Triarchic model of psychopathy: Origins, operationalizations, and observed linkages with personality and general psychopathology. *Journal of Personality*, 83(6), 627–643.
- Patrick, C. J., Edens, J. F., Poythress, N. G., Lilienfeld, S. O., & Benning, S. D. (2006). Construct validity of the psychopathic personality inventory two-factor model with offenders. *Psychological Assessment*, 18(2), 204–208.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, 21(3), 913–938.
- Patrick, C. J., Hicks, B. M., Krueger, R. F., & Lang, A. R. (2005). Relations between psychopathy facets and externalizing in a criminal offender sample. *Journal* of Personality Disorders, 19(4), 339–356.
- Patrick, C. J., Hicks, B. M., Nichol, P. E., & Krueger, R. F. (2007). A bifactor approach to modeling the structure of the Psychopathy Checklist—Revised. *Journal* of Personality Disorders, 21(2), 118–141.
- Pech, R. J., & Slade, B. W. (2007). Organisational sociopaths: Rarely challenged, often promoted: Why? Society and Business Review, 2(3), 254–269.
- Piquero, A. R., Farrington, D. P., Fontaine, N. M. G., Vincent, G., Coid, J., & Ullrich, S. (2012). Childhood risk, offending trajectories, and psychopathy at age 48 years in the Cambridge Study in Delinquent Development. *Psychology, Public Policy, and Law,* 18(4), 577–598.
- Porter, S., Birt, A. R., & Boer, D. P. (2001). Investigation of the criminal and conditional release profiles of Canadian federal offenders as a function of psychopathy and age. *Law and Human Behavior*, 25(6), 647–661.
- Poythress, N. G., Lilienfeld, S. O., Skeem, J. L., Douglas,

K. S., Edens, J. F., Epstein, M., et al. (2010). Using the PCL-R to help estimate the validity of two self-report measures of psychopathy with offenders. *Assessment*, 17(2), 206–219.

- Raine, A., Ishikawa, S. S., Arce, E., Lencz, T., Knuth, K. H., Bihrle, S., et al. (2004). Hippocampal structural asymmetry in unsuccessful psychopaths. *Biological Psychiatry*, 55(2), 185–191.
- Rauthmann, J. F. (2012). The Dark Triad and interpersonal perception: Similarities and differences in the social consequences of narcissism, machiavellianism, and psychopathy. Social Psychological and Personality Science, 3(4), 487–496.
- Rauthmann, J. F., & Kolar, G. P. (2013). The perceived attractiveness and traits of the Dark Triad: Narcissists are perceived as hot, Machiavellians and psychopaths not. *Personality and Individual Differences*, 54(5), 582–586.
- Reidy, D. E., Zeichner, A., Miller, J. D., & Martinez, M. A. (2007). Psychopathy and aggression: Examining the role of psychopathy factors in predicting laboratory aggression under hostile and instrumental conditions. *Journal of Research in Personality*, 41(6), 1244–1251.
- Rilling, J. K., Glenn, A. L., Jairam, M. R., Pagnoni, G., Goldsmith, D. R., Elfenbein, H. A., & Lilienfeld, S. O. (2007). Neural correlates of social cooperation and non-cooperation as a function of psychopathy. *Biological Psychiatry*, 61(11), 1260–1271.
- Ross, S. R., Benning, S. D., Patrick, C. J., Thompson, A., & Thurston, A. (2009). Factors of the psychopathic personality inventory: Criterion-related validity and relationship to the BIS/BAS and five-factor models of personality. Assessment, 16(1), 71–87.
- Saks, E. R. (2007). The center cannot hold: My journey through madness. New York: Hyperion.
- Sanecka, E. (2013). The effects of supervisor's subclinical psychopathy on subordinates' organizational commitment, job satisfaction and satisfaction with supervisor. *Journal of Education*, *Culture, and Society*, 2, 172–191.
- Seara-Cardoso, A., Neumann, C., Roiser, J., McCrory, E., & Viding, E. (2012). Investigating associations between empathy, morality and psychopathic personality traits in the general population. *Personality and Individual Differences*, 52(1), 67–71.
- Sellbom, M., Ben-Porath, Y. S., Lilienfeld, S. O., Patrick, C. J., & Graham, J. R. (2005). Assessing psychopathic personality traits with the MMPI-2. *Journal of Personality Assessment*, 85(3), 334–343.
- Sellbom, M., Ben-Porath, Y. S., Patrick, C. J., Wygant, D. B., Gartland, D. M., & Stafford, K. P. (2012). Development and construct validation of MMPI-2-RF indices of global psychopathy, fearless-dominance, and impulsive-antisociality. *Personality Disorders*, 3(1), 17–38.
- Sellbom, M., Ben-Porath, Y. S., & Stafford, K. P. (2007). A comparison of MMPI–2 measures of psychopathic

deviance in a forensic setting. Psychological Assessment, 19(4), 430-436.

- Sellbom, M., & Phillips, T. R. (2013). An examination of the triarchic conceptualization of psychopathy in incarcerated and nonincarcerated samples. *Journal of Abnormal Psychology*, 122(1), 208–214.
- Sellbom, M., Wygant, D. B., & Drislane, L. E. (2015). Elucidating the construct validity of the Psychopathic Personality Inventory Triarchic scales. *Journal of Personality Assessment*, 97(4), 374–381.
- Silver, E., Mulvey, E. P., & Monahan, J. (1999). Assessing violence risk among discharged psychiatric patients: Toward an ecological approach. *Law and Human Behavior*, 23(2), 237–255.
- Skeem, J. L., Polaschek, D. L. L., Patrick, C. J., & Lilienfeld, S. O. (2011). Psychopathic personality: Bridging the gap between scientific evidence and public policy. Psychological Science in the Public Interest, 12(3), 95–162.
- Smith, G. T., Fischer, S., & Fister, S. M. (2003). Incremental validity principles in test construction. Psychological Assessment, 15(4), 467–477.
- Smith, R. J. (1978). *The psychopath in society*. New York: Academic Press.
- Smith, S. F., & Lilienfeld, S. O. (2013). Psychopathy in the workplace: The knowns and unknowns. Aggression and Violent Behavior, 18(2), 204–218.
- Smith, S. J., Lilienfeld, S. O., Coffey, K., & Dabbs, J. M. (2013). Are psychopaths and heroes twigs off the same branch?: Evidence from college, community, and presidential samples. *Journal of Research in Per*sonality, 47(5), 634–646.
- Snowden, R. J., Gray, N. S., Pugh, S., & Atkinson, G. (2013). Executive function as a function of sub-clinical psychopathy. *Personality and Individual Differences*, 55(7), 801–804.
- Stanley, J. H., Wygant, D. B., & Sellbom, M. (2013). Elaborating on the construct validity of the Triarchic Psychopathy Measure in a criminal offender sample. *Journal of Personality Assessment*, 95(4), 343–350.
- Stevens, G. W., Deuling, J. K., & Armenakis, A. A. (2012). Successful psychopaths: Are they unethical decision-makers and why? *Journal of Business Ethics*, 105(2), 139–149.
- Sutker, P. B., & Allain, A. N. (1983). Behavior and personality assessment in men labeled adaptive sociopaths. Journal of Behavioral Assessment, 5(1), 65–79.
- Swogger, M. T., Walsh, Z., Houston, R. J., Cashman-Brown, S., & Conner, K. R. (2010). Psychopathy and axis I psychiatric disorders among criminal offenders: Relationships to impulsive and proactive aggression. *Aggressive Behavior*, 36(1), 45–53.
- Swogger, M. T., Walsh, Z., Lejuez, C. W., & Kosson, D. S. (2010). Psychopathy and risk taking among jailed inmates. *Criminal Justice and Behavior*, 37(4), 439–452.
- Ullrich, S., Farrington, D. P., & Coid, J. W. (2008). Psy-

chopathic personality traits and life-success. *Personality and Individual Differences*, 44(5), 1162–1171.

- Vaidyanathan, U., Hall, J. R., Patrick, C. J., & Bernat, E. M. (2011). Clarifying the role of defensive reactivity deficits in psychopathy and antisocial personality using startle reflex methodology. *Journal of Abnormal Psychology*, 120(1), 253–258.
- Valliant, P. M., Freeston, A., Pottier, D., & Kosmyna, R. (2003). Personality and executive functioning as risk factors in recidivists. *Psychological Reports*, 92(1), 299–306.
- van Honk, J., Hermans, E. J., Putman, P., Montagne, B., & Schutter, D. J. L. G. (2002). Defective somatic markers in sub-clinical psychopathy. *NeuroReport*, 13(8), 1025–1027.
- Veit, R., Lotze, M., Sewing, S., Missenhardt, H., Gaber, T., & Birbaumer, N. (2010). Aberrant social and cerebral responding in a competitive reaction time paradigm in criminal psychopaths. *NeuroImage*, 49(4), 3365–3372.
- Venables, N. C., Hall, J. R., & Patrick, C. J. (2014). Differentiating psychopathy from antisocial personality disorder: A triarchic model perspective. *Psychological Medicine*, 44(5), 1005–1013.
- Venables, N. C., & Patrick, C. J. (2012). Validity of the Externalizing Spectrum Inventory in a criminal offender sample: Relations with disinhibitory psychopathology, personality, and psychopathic features. *Psychological Assessment*, 24(1), 88–100.
- Venables, N. C., Sellbom, M., Sourander, A., Kendler, K. S., Joiner, T. E., Drislane, L. E., et al. (2015). Separate and interactive contributions of weak inhibitory control and threat sensitivity to prediction of suicide risk. *Psychiatry Research*, 226(2–3), 461–466.
- Verona, E., Patrick, C. J., & Joiner, T. E. (2001). Psychopathy, antisocial personality, and suicide risk. *Journal of Abnormal Psychology*, 110(3), 462–470.
- Wai, M., & Tiliopoulos, N. (2012). The affective and cognitive empathic nature of the dark triad of personality. Personality and Individual Differences, 52(7), 794–799.
- Walker, L. J., Frimer, J. A., & Dunlop, W. L. (2010). Varieties of moral personality: Beyond the banality of heroism. *Journal of Personality*, 78(3), 907–942.
- Walsh, Z., & Kosson, D. S. (2007). Psychopathy and violent crime: A prospective study of the influence of socioeconomic status and ethnicity. *Law and Human Behavior*, 31(2), 209–229.
- Walsh, Z., Swogger, M. T., & Kosson, D. S. (2004). Psychopathy, IQ, and violence in European American and African American county jail inmates. *Journal of Consulting and Clinical Psychology*, 72(6), 1165–1169.
- Walsh, Z., Swogger, M. T., & Kosson, D. S. (2009). Psychopathy and instrumental violence: Facet level relationships. *Journal of Personality Disorders*, 23(4), 416–424.
- Walters, G. D., Brinkley, C. A., Magaletta, P. R., & Diamond, P. M. (2008). Taxometric analysis of the

Levenson Self-Report Psychopathy scale. Journal of Personality Assessment, 90(5), 491–498.

- Watts, A. L., Salekin, R. T., Harrison, N., Clark, A., Waldman, I. D., Vitacco, M. J., et al. (2016). Psychopathy: Relations with three conceptions of intelligence. *Personality Disorders*, 7(3), 269–279.
- Weiner, M. (Writer/Director/Producer). (2007). Mad men [Television series]. New York: AMC.
- Westerlaken, K. M., & Woods, P. R. (2013). The relationship between psychopathy and the Full Range Leadership Model. *Personality and Individual Differences*, 54(1), 41–46.
- Wexler, M. N. (2008). Conjectures on systemic psychopathy: Reframing the contemporary corporation. Society and Business Review, 3(3), 224–238.
- White, J. L., Moffitt, T. E., & Silva, P. A. (1989). A prospective replication of the protective effects of IQ in subjects at high risk for juvenile delinquency. *Journal* of Consulting and Clinical Psychology, 57(6), 719–724.
- Widom, C. S. (1977). A methodology for studying noninstitutionalized psychopaths. Journal of Consulting and Clinical Psychology, 45(4), 674–683.
- Widom, C. S., & Newman, J. P. (1985). Characteristics of non-institutionalized psychopaths. In D. P. Farrington & J. Gunn (Eds.), Aggression and dangerousness (pp. 57–80). New York: Wiley.
- Wiebe, R. P. (2004). Psychopathy and sexual coercion: A Darwinian analysis. Counseling and Clinical Psychology Journal, 1, 23–41.
- Wiggins, J. S. (1991). Agency and communion as conceptual coordinates for the understanding and measurement of interpersonal behavior. In D. Cicchetti & W. M. Grove (Eds.), *Thinking clearly about psychology: Essays in honor of Paul E. Meehl: Vol. 2. Personality and psychopathology* (pp. 89–113). Minneapolis: University of Minnesota Press.
- Williams, K. M., Nathanson, C., & Paulhus, D. L. (2010). Identifying and profiling scholastic cheaters: Their personality, cognitive ability, and motivation. *Journal of Experimental Psychology: Applied*, 16(3), 293–307.
- Williams, K. M., Paulhus, D. L., & Hare, R. D. (2007). Capturing the four-factor structure of psychopathy in college students via self-report. *Journal of Personality Assessment*, 88(2), 205–219.
- Willimon, B. (Creator/Executive Producer). (2013). House of cards [Television series]. Los Gatos, CA: Netflix.
- Wilson, M. S., & McCarthy, K. (2011). Greed is good?: Student disciplinary choice and self-reported psychopathy. Personality and Individual Differences, 51(7), 873–876.
- Wootton, J. M., Frick, P. J., Shelton, K. K., & Silverthorn, P. (1997). Ineffective parenting and childhood conduct problems: The moderating role of callous– unemotional traits. *Journal of Consulting and Clinical Psychology*, 65(2), 301–308.
- Yamagishi, T., Li, Y., Takagishi, H., Matsumoto, Y., &

Kiyonari, T. (2014). In search of Homo economicus. *Psychological Science*, 25(9), 1699–1711.

- Yang, Y., Raine, A., Colletti, P., Toga, A. W., & Narr, K. L. (2010). Morphological alterations in the prefrontal cortex and the amygdala in unsuccessful psychopaths. *Journal of Abnormal Psychology*, 119(3), 546–554.
- Yang, Y., Raine, A., Lencz, T., Bihrle, S., LaCasse, L., & Colletti, P. (2005). Volume reduction in prefrontal gray matter in unsuccessful criminal psychopaths. *Biological Psychiatry*, 57(10), 1103–1108.
- Yeh, M. T., Chen, P., Raine, A., Baker, L. A., & Jacobson, K. C. (2011). Child psychopathic traits moderate relationships between parental affect and child aggression. *Journal of the American Academy of Child and Adolescent Psychiatry*, 50(10), 1054–1064.
- Zimak, E. H., Suhr, J., & Bolinger, E. M. (2014). Psychophysiological and neuropsychological characteristics of non-incarcerated adult males with higher levels of psychopathic personality traits. *Journal of Psychopathology and Behavioral Assessment*, 36(4), 542–554.

## PART VI

# CLINICAL AND APPLIED ISSUES IN PSYCHOPATHY

### CHAPTER 25

## **Psychopathy and Aggression**

STEPHEN PORTER MICHAEL T. WOODWORTH PAMELA J. BLACK

sychopaths are manipulative, callous, remorseless, impulsive, irresponsible, antisocial individuals with an emotionally barren disposition. Together, these traits often result in aggressive behavior, and our purpose in this chapter is to explore the manner in which, and the reasons why, this may occur. We begin by outlining the contribution of psychopathy to the prediction of whether, and the degree to which, specific persons, among criminal offenders in particular, engage in aggressive behavior. Our attention then turns to the characteristics of violent actions by psychopathic individuals. We review studies investigating the nature of their violent behavior, consider research on links among psychopathy, thrill-seeking, and sadistic behavior, and discuss how this work can inform our understanding of the criminal motivations of violent psychopathic offenders. We conclude with a discussion of other populations (youth and civil psychiatric patients) in which psychopathy, and affiliated aggressive behaviors, are manifested.

### The Link between Psychopathy and Aggression in Adult Offenders

While it is clear that some high-psychopathic individuals (those termed "white-collar" or "successful psychopaths") engage in little or no violence, a large body of research has shown that the presence of psychopathic traits is associated with proneness to aggressive behavior, including the most violent and potentially deadly forms of aggression (e.g., Reidy, Zeichner, & Seibert, 2011). In one of the earliest investigations of the relationship between psychopathy and violence, Hare and Jutai (1983) found that incarcerated adult male offenders classified as psychopathic (based on global ratings of resemblance to Cleckley's [1976] clinical description) had been charged with violent crimes about twice as often as offenders classified as nonpsychopathic. Virtually all of the high-psychopathic individuals in their sample had perpetrated at least one violent crime. Within a large sample of male federal prisoners (mean age = 43.5), Porter, Birt, and Boer (2001) found that those identified as psychopathic using Hare's (1991, 2003) Psychopathy Checklist-Revised (PCL-R) had been convicted of an average of 7.32 violent crimes, compared to an average of 4.52 for those classified as nonpsychopathic. This pattern of a relatively high level of violent behavior by psychopathic offenders is witnessed throughout their criminal careers (e.g., Harpur & Hare, 1994; Porter, Birt, & Boer, 2001). Thus, it is clear that offenders who meet criteria for psychopathy are a highly aggressive group, both in comparison to low-psychopathy offenders and in terms of the sheer number of violent crimes they perpetrate.

Moreover, aggression in high-psychopathic individuals may manifest in ways other than overt violence. For example, relational aggression involving threats, dominance, and emotional abuse also has been linked to psychopathy. This is particularly true for high-psychopathic females, who are more likely than males to direct their aggression toward family members and to engage in physical and emotional abuse in the home (Gray & Snowden, 2016; Nicholls, Ogloff, Brink, & Spidel, 2005; Robbins, Monahan, & Silver, 2003). Because much of this type of aggression occurs out of the public eye and within perpetrators' own families, it is far less likely to be reported (Nicholls et al., 2005; see Verona & Vitale, Chapter 21, this volume, for detailed information on psychopathy in females). As such, the amount of violence committed by high-psychopathic individuals is likely underestimated.

Since the first edition of this handbook, online communication has proliferated and research has begun to explore whether high-psychopathic individuals display evidence of an aggressive disposition in online environments as well. Early studies suggest that they do behave in an aggressive manner online. For example, Buckels, Trapnell, and Paulhus (2014) found that individuals high in psychopathy, as well as those high in the affiliated trait of Machiavellianism (Christie & Geis, 1970), often engage in online "trolling," defined as behaving in a destructive and hostile manner toward other Internet users for no obvious purpose other than to wreak havoc in their lives. Looking at social media in particular, Hancock, Woodworth, and Boochever (2015) compared the natural language used in e-mails, text messages, Facebook, and Twitter to a large group of student participant's scores on a self-report measure of psychopathy. Participants with higher levels of psychopathy used more interpersonally hostile language, such as anger-related words and profanities in online contexts, suggesting that their penchant for aggression is evident in their online activities as well.

Knowledge of the psychopathy–aggression link has contributed greatly to work focusing on the prediction of future violent behavior in adult offenders (e.g., Harris, Rice, & Quinsey, 1993; Hawes, Boccaccini, & Murrie, 2013; Hemphill, Hare, & Wong, 1998; Leistico, Salekin, DeCoster, & Rogers, 2008; Mokros, Vohs, & Habermeyer, 2014; Rice & Harris, 1997; Salekin, Rogers, & Sewell, 1996; Yang, Wong, & Coid, 2010; see Douglas, Vincent, & Edens, Chapter 28, this volume) and in community samples (e.g., Vitacco, Neumann, & Pardini, 2014). In fact, over the last two decades, psychopathy has become one of the primary indicators used by clinicians to predict risk for future violence (Walsh & Walsh, 2006). For example, Serin and Amos (1995) found that offenders classified as psychopathic using the PCL-R were about five times more likely than offenders classified as nonpsychopathic to engage in violent recidivism within 5 years of their release from prison. Metaanalyses indicate that psychopathy, as measured by the PCL-R, shows overall effect sizes of r =.27-.37 in predicting violence of different types (e.g., Hemphill, Templeman, Wong, & Hare, 1998; Salekin et al., 1996). The predictive power of psychopathy assessed in this manner for recidivism has also been demonstrated cross-culturally. For example, in a meta-analysis, Mokros, Schilling, Weiss, Nitschke, and Eher (2014) found that scores on both the PCL-R and its abbreviated screening version (PCL:SV) operated as robust predictors of violent recidivism within German-speaking countries (but see Walsh, 2013, for a consideration of the varying predictive power of high psychopathy scores across samples with different ethnic backgrounds).

Given the abundant evidence linking psychopathy to varying types of violent behavior (e.g., sexual, nonsexual), as well as frequency and severity of violent offending, it is a key construct to consider in evaluating potential for aggression (Coid & Yang, 2011; Walsh & Kosson, 2008). Indeed, psychopathy has been characterized as one of the most critical and relevant psychological constructs for the criminal justice system (Harris, Skilling, & Rice, 2001; Monahan, 2006).

### Flawed Predators: Mixed Motivations for Aggression in Psychopathic Individuals

It has been long recognized that psychopathic individuals expend appreciable time and energy in exploiting others. Given their characteristic deficits in empathy and remorse, they lack inhibitions against using other people for material gain, drugs, sex, or power (Black, Woodworth, & Porter, 2014; LeBreton, Baysinger, Abbey, & Jacques-Tiura, 2013). Accordingly, psychopathic individuals are typically adept con artists, often with long histories of frauds and scams. Some may even become cult leaders, corrupt politicians, or successful corporate leaders (Babiak & Hare, 2006; Babiak, Neumann, & Hare, 2010). Their superficially engaging personalities and skilled use of deception through verbal and nonverbal communication likely contribute to their proficiency as "intraspecies predators" (Hare, 1993): The high level of psychological dangerousness they pose to others is masked by disarming but ill-intended social artistry. Thus, many nonviolent but pernicious actions of psychopathic individuals involve forethought and are instrumentally and skillfully orchestrated. In fact, most antisocial behavior by "white-collar psychopaths" may be characterized in this way (e.g., Babiak, 2000).

Clinical and empirical observations suggest that some physically aggressive actions by highpsychopathic individuals share these characteristics of premeditation and instrumentality. For example, psychopathic criminals often perpetrate well-planned armed robberies or hostage takings (Hervé, Mitchell, Cooper, Spidel, & Hare, 2004). Even in adolescence, psychopathic individuals often engage in deliberate aggressive acts from which they anticipate positive rewards (Pardini, Lochman, & Frick, 2003). However, most of these psychopathic individuals have difficulty controlling themselves at times. Their actions may be highly spontaneous and foolhardy, in ways that contribute to detection, arrest, and incarceration. Thus, psychopathic behavior can be seen as arising from mixed motivations. On one hand, psychopathic individuals engage in strategic, premeditated acts to achieve selfish aims; on the other, they can react in impulsive, explosive, and self-defeating ways to immediate events or circumstances.

In this light, individuals of this sort can be seen as "flawed predators," frequently preying on others but unable to reliably control their behavior. As an example of this, Porter conducted a risk assessment on a young psychopathic client named "Glen," who, according to his family members, was a "likable" child but had "lied to everyone" and was "like Jekyll and Hyde," quickly shifting from being friendly to acting aggressively. Throughout adolescence and into adulthood, he had committed various types of violent acts, some highly premeditated and others unplanned and impulsive. In this respect, psychopathic individuals may appear to others to have two "personalities." A historic figure who exhibited this dualistic quality was Russian dictator Joseph Stalin; he maintained great power over the populace while continuing to dominate, intimidate, and deceive other people on a massive scale. These examples illustrate how the dangerous proclivities of psychopathic individuals are often disguised by ostensible charm, gregariousness, and an outward appearance of normality. Ishikawa, Raine, Lencz, Bihrle, and LaCasse (2001) have used the term "successful psychopaths" for highly psychopathic individuals who are able to effectively conceal their unethical, exploitative tendencies behind a veil of normality, and thereby function successfully in society (see also Aharoni, & Kiehl, 2013; Benning, Patrick, Hicks, Blonigen, & Krueger, 2003; Stevens, Deuling, & Armenakis, 2012).

Researchers have begun to examine more systematically the role these seemingly paradoxical attributes of goal-oriented premeditation and weak behavioral controls play in the violent conduct of psychopathic individuals. Accumulating data are painting an interesting picture of how individuals of this type perpetrate aggression, and providing insight into the attitudes they hold toward such behavior.

### Reactive and Instrumental Forms of Aggression in Psychopathic Individuals

A key consideration in understanding violent behavior is whether the motivation of the perpetrator is "defensive" or "offensive" (see Cooke, Michie, De Brito, Hodgins, & Sparkes, 2011); that is, does the aggressive behavior reflect a reaction to desperate emotional circumstances or, instead, is it more volitional and instrumental? One longstanding view holds that aggression is grounded in frustration and provocation. Along this line, Berkowitz (1983) argued that aggression is best conceptualized as a hostile reaction to a perceived threat or dangerous situation, and Anderson and Bushman (2002) posited that provocation may be the single most important cause of human aggression. However, other writers have focused on intentional, goal-oriented aspects of aggressive behavior (e.g., Bandura, 1983). There appears to be merit in both of these perspectives (Stanford et al., 2003), and consideration of both reactive and instrumental elements of aggression is essential toward understanding motivations behind violent actions (Brown, Atkins, Osborne, & Milnamow, 1996; Dodge, 1991) and delineating different types of aggressors (Stanford et al., 2003). For example, instrumental aggression by children is associated with atypical affective functioning and foreshadows a pattern of long-term antisocial behavior (Fite, Raine, Stouthamer-Loeber, Loeber, & Pardini, 2010; Pulkkinen, 1996; Raine et al., 2006; van Baardewijk, Vermeiren, Stegge, & Doreleijers, 2011; Vitaro, Gendreau, Tremblay, & Oligny, 1998). However, some violent acts contain elements of both reactivity and instrumentality (Bushman & Anderson, 2001). For example, Barratt, Stanford, Dowdy, Liebman, and Kent (1999) found that only 20–25% of the aggressive acts coded in their sample could be classified as either strictly premeditated or impulsive. Therefore, researchers who study aggressive behavior must refine their operational definitions beyond simply "instrumental" or "reactive" in order to capture the complexities of motivations for violence.

### Motivations for Psychopathic Violence in General

Given the concurrent attributes of callous premeditation and poor behavioral controls associated with the actions of psychopathic individuals in general, predicting whether the violent acts they perpetrate will be primarily reactive or instrumental is not straightforward. Drawing on clinical cases he documented, Cleckley (1976) characterized violence committed by such individuals as more instrumental than violence perpetrated by other antisocial individuals, who typically react violently out of rage or despair. In the first empirical evaluation of this viewpoint, Williamson, Hare, and Wong (1987) examined characteristics of violent offenses committed by 101 incarcerated Canadian offenders. They found that high-psychopathic offenders (identified using the original 22-item version of the PCL; Hare, 1980) were more likely (45.2% of the time) to have been motivated by an external goal such as material gain than were low-psychopathic offenders (14.6% of the time). Additionally, psychopathic offenders were less likely (2.4% of the time) to have experienced emotional arousal during their crimes than were nonpsychopathic offenders (31.7% of the time).

In a subsequent study of this type, Cornell and colleagues (1996) investigated the violent criminal histories of 106 male offenders incarcerated in a U.S. state prison. Adopting a somewhat different approach, these investigators focused on whether the criminal records of offenders included one or more offenses involving instrumental violence. In line with Cleckley's (1976) predictions and Williamson and colleagues' (1987) findings, they found that offenders identified as highly psychopathic using the PCL-R were more likely to have perpetrated instrumentally violent crimes than nonpsychopathic offenders, who more typically committed reactively violent crimes. Furthermore, consistent with the findings of Williamson and colleagues, instrumental violence was associated with a self-reported lack of emotional arousal during the violent act. Also consistent with this, Chase, O'Leary, and Heyman (2001) reported a relationship between psychopathy as assessed by a self-report inventory and the use of instrumental violence in a sample of 60 male spousal assaulters. Whereas 17% of men in this sample who scored high in psychopathy were classified as being "instrumentally aggressive," none were classified as "reactively aggressive." Dempster and colleagues (1996) reviewed the files of 75 adult male violent offenders participating in an inpatient treatment program. Although offenders who scored high on the PCL-R were found to have committed more instrumental violence than low PCL-R offenders, they also had displayed impulsive behavior in the context of their crimes. Hart and Dempster (1997) concluded that while psychopathic offenders may be more likely to commit instrumental crimes, their behavior is best described as "impulsively instrumental" (also see Dempster et al., 1996).

Since these earlier studies of psychopathy and motivation for aggression, research has begun to break down the constructs of psychopathy to understand their associations with differing motivations for violence (for a detailed description, see Part II, "Distinct Phenotypic Facets of Psychopathy," this volume; see also Hare, Black, & Walsh, 2013). There is evidence that scores on Factor 1 of PCL-R psychopathy, reflecting emotional coldness and manipulativeness, are related to premeditated, unprovoked, instrumental aggression (Reidy, Zeichner, Miller, & Martinez, 2007; Reidy, Zeichner, & Seibert, 2011), whereas scores on Factor 2, reflecting impulsive-irresponsible tendencies and antisocial behaviors, are more highly correlated with reactive violence (Falkenbach, Poythress, & Creevy, 2008; Hecht, Berg, Lilienfeld, & Latzman, 2016; Reidy et al., 2007; Reidy, Zeichner, & Martinez, 2008). Furthermore, at the facet level, PCL-R Facets 1 and 2 have been related to premeditated aggression, and Facets 3 and 4 to impulsive aggression (Declercq, Willemsen, Audenaert, & Verhaeghe, 2012; Flight & Forth, 2007; Snowden & Gray, 2011; Walsh, Swogger, & Kosson, 2009). These findings are in line with the previously noted results indicating that instrumental violence is related to little, if any, emotional arousal during acts of aggression.

Blais, Solodukhin, and Forth (2014) reported findings from a meta-analysis examining relations for psychopathy as indexed by various available measures-including clinical rating (e.g., PCL-R and its variants), informant (e.g., Antisocial Process Screening Device; APSD; Frick & Hare, 2001), and self-report inventories (e.g., Psychopathic Personality Inventory [PPI]; see below)-with instrumental and reactive violence (55 unique samples, N = 8,753), providing the most comprehensive examination of the topic to date. Their results indicated moderate and significant relationships between total psychopathy scores for various inventories and both instrumental and reactive violence. To help clarify the basis of the relationships for overall psychopathy, analyses were also performed for the two broad symptom factors (1 = affective-interpersonal, 2 = impulsive-antisocial) in studies that reported results for these. Specifically (and consistent with results from individual studies cited earlier), instrumental violence was associated with elevated scores on Factor 1 (for the PCL-R, and its Interpersonal facet in particular), whereas Factor 2 scores were more predictive of reactive violence. Interestingly, this large meta-analysis also revealed that the Lifestyle facet (Facet 3) of the PCL-R was associated with both types of violent outcomes, suggesting that some clinical features of psychopathy may be associated with multiple motivations for aggressive behavior.

Links between psychopathy and motives for aggression have also been explored experimentally with laboratory paradigms. Specifically, Reidy and colleagues (2008) examined reactions of male undergraduate participants (N = 120) to provoked and unprovoked aggression in a sham aggression paradigm. The results indicated that those high in psychopathy, as indexed by overall scores on the Levenson Self-Report Psychopathy Scale (SRP; Levenson, Kiehl, & Fitzpatrick, 1995) were 30% more likely to act aggressively without provocation. Furthermore, those participants who exhibited aggression without provocation were also more likely to respond with severe and sustained aggression when they were provoked.

Much of the research considered thus far has focused on the construct of psychopathy as defined by the PCL-R. Since the first edition of this handbook, there has been considerable debate about constituent subdimensions of psychopathy, as well as the manner in which psychopathy should be measured. Focusing on psychopathy as indexed by the PCL-R, dissent has arisen around whether psychopathy is best represented by a two-factor/ four-facet model (Hare & Neumann, 2010; Hare, Neumann, & Mokros, Chapter 3, this volume), or a three-factor model (Cooke & Michie, 2001; Skeem & Cooke, 2010). Proponents of the threefactor PCL-R model have argued that antisocial behavior is not a feature of psychopathy itself but an expression of more basic interpersonal, affective, and impulsive traits. Considering debates about the content and structure of the PCL-R and other measures, along with historic and contemporary writings on the construct of psychopathy more broadly, Patrick, Fowles, and Krueger (2009) postulated that the construct encompasses distinct facet dimensions of boldness, meanness, and disinhibition (see also Skeem, Polaschek, Patrick, & Lilienfeld, 2011). The self-report-based Triarchic Psychopathy Measure (TriPM; Drislane, Patrick, & Arsal, 2014) was developed to index these facet dimensions specifically through item-based scales. Recent studies using the TriPM to investigate psychopathy-aggression associations have provided support for the utility of this model when considering motivations for violence. For example, Marcus and Norris (2014) evaluated relations between subscales of the TriPM and sexual coercion using a vignette paradigm. They found that scores on all three TriPM scales (Boldness, Meanness, Disinhibition) predicted reported use of low-level sexually predatory tactics, and that Disinhibition was uniquely predictive of use of severe, potentially criminal coercive tactics.

With regard to the assessment of psychopathy through self-report, the most widely used measure over the past decade has been the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996) and its revised version (PPI-R; Lilienfeld & Widows, 2005). The PPI includes eight subcales; factor analyses of these subscales (e.g., Benning et al., 2003) have revealed two higher-order factors: Fearless Dominance (FD), encompassing traits related to boldness (social potency, stress immunity, fearlessness), and Self-Centered Impulsivity (SCI), encompassing traits related to disinhibition (nonplanfulness, rebelliousness, alienation), along with some representation of meanness (through the PPI's Machiavellianism scale). Separate from these broad factors, the PPI also includes a Coldheartedness scale that uniquely indexes callous unemotionality (meanness; Drislane et al., 2014). In relation to the PCL-R, the PPI FD factor is most closely related to Factor 1 (the Interpersonal facet, in particular) and the SCI factor is most related to Factor 2, though the correlations between factors of the two instruments are small to moderate (presumably due to differences in measurement method [cf. Blonigen et al., 2010] as well as item content).

A number of published studies have examined links between scores on the two PPI factors and aggressive behavior. Most of these studies have examined relations between each of these factors and aggression in general, as opposed to specific motivations for aggression. Overwhelmingly, it appears that the FD factor is negligibly related to general aggression in adults, whereas the SCI factor is a strong predictor of overall aggression (Edens, Poythress, Lilienfeld, & Patrick, 2008a; Edens, Poythress, Lilienfeld, Patrick, & Test, 2008b; Falkenbach, Poythress, Falki, & Manchak, 2007; Patrick, Edens, Poythress, Lilienfeld, & Benning, 2006). Some studies that have examined links between the PPI-R factors and distinct types of aggressive behavior have shown that the FD factor is predictive of instrumental aggression (Cima & Raine, 2009; Ostrov & Houston, 2008; Stanford, Houston, & Baldridge, 2008), paralleling the relationship for PCL Factor 1, with the SCI factor being related to aggression as a whole, both instrumental and reactive (Cima & Raine, 2009; Ostrov & Houston, 2008). The results of a recent study conducted with 200 forensic inpatients by Smith, Edens, and McDermott (2013) corroborated previous evidence for a relationship between FD scores and instrumental aggression but indicated that SCI scores were predictive of general aggression and predatory aggression, but not "impulsive" aggression. Morever, in another study of 158 male offenders, Camp, Skeem, Barchard, Lilienfeld, and Poythress (2013) found that only the SCI factor of the PPI was associated with an instrumental pattern of violence, with no association evident for the interpersonal-affective component. Additional research is needed to resolve these contrasting findings, but available evidence as a whole suggests that, paralleling findings for Factor 1 of the PCL-R, it is the affective-interpersonal features of PPI psychopathy that relate to the cold-blooded and premeditated aggression often committed by psychopathic offenders.

The support for a relationship between psychopathy and instrumental violence has certainly mounted since the first edition of this handbook was published. In line with preliminary results first reported in this chapter, the majority of subsequent published research still suggests that the affective deficits characteristic of psychopathy (whether indexed by Factor 1 of the PCL-R, or the FD factor of the PPI-R) is the driving force behind the increased premeditated violence committed by highpsychopathic offenders. By contrast, the relationship between psychopathy and reactive violence is not as clear. It appears that total scores and Factor 2/SCI scores are often related to impulsive aggression, but to a lesser degree than Factor 1 scores correlate with instrumental aggression. Indeed, in an in-depth review of research on the relationship between psychopathy and reactive violence, Reidy, Shelley-Tremblay, and Lilienfeld (2011) concluded that existing evidence as a whole points to psychopathy as a protective factor against impulsive violence.

### Characteristics of Homicides by Psychopathic Individuals

Homicide is a heterogeneous crime in terms of the characteristics of both the perpetrator and the contexts in which it occurs. In particular (and similar to the instrumental-reactive distinction outlined earlier), some homicides are meticulously planned instrumental acts, whereas others involve a lack of premeditation. Acts of the latter type may occur in the context of an emotional dispute or in response to a situational provocation (a "crime of passion"). Early research on the relationship between psychopathy and homicide revealed that psychopathic offenders who killed had higher scores on Factor 1 of the PCL-R than did other high-psychopathy offenders (Porter, Birt, & Boer, 2001). The implication was that psychopathic murderers might be particularly ruthless individuals without compunctions against instrumental violence. In contrast with this, nonpsychopathic offenders who had committed murder showed higher Factor 2 scores than those who had not (Porter, Birt, & Boer, 2001), in line with the idea of more impulsive- reactive aggressive tendencies for this factor.

To evaluate whether the relationship between psychopathy and instrumental violence would hold true for murder, the ultimate act of violence, Woodworth and Porter (2002) focused on the offense characteristics of 125 male homicide offenders incarcerated in one of two Canadian federal prisons and assessed psychopathy using the PCL-R. They reasoned that if the pattern for general violence held true, psychopathic murderers would perpetrate both types of homicides but would show a greater propensity toward reactive homicides. Nonpsychopathic offenders, on the other hand, were expected to rarely perpetrate instrumental homicides. A "reactive" homicide was conceptualized as being unplanned and immediately preceded by a provocative situation—one perceived to be threatening, emotionally provoking, and perhaps inescapable-that resulted in violent "lashing out." Conversely, it was possible for a homicide to be premeditated and not preceded by powerful affect. If the homicide exhibited these characteristics and the perpetrator had an external incentive (e.g., material gain, drugs, or sex) for committing the violent act, it was classified as "instrumental." The degree of instrumentality versus reactivity of each homicide was rated by coders who were unaware of the offender's psychopathy rating. Results indicated that psychopathic offenders were about twice as likely as nonpsychopathic offenders to have engaged in primarily instrumental homicides. In fact, nearly all (93.3%) of the homicides perpetrated by offenders diagnosed as psychopathic were primarily instrumental, compared to 48.4% of the homicides committed by nonpsychopathic offenders.

Perhaps most surprising was the finding that high-psychopathy offenders were unlikely to have perpetrated a reactive homicide, despite earlier findings that they often engage in reactive violence generally (Cornell et al., 1996; Williamson et al., 1987). These data called into question the assumption that the behavior of psychopathic individuals is truly impulsive. To address this, Woodworth and Porter (2002) advanced a "selective impulsivity" explanation, which posits that the impulsive aggression of these individuals in selected contexts is considered less uncontrollable than it appears. Rather, it reflects a choice not to inhibit such behavior when the repercussions for acting aggressively are perceived to be low (see also Arnett, Smith, & Newman, 1997; Newman & Wallace, 1993). By contrast, when they recognize that the consequences of acting aggressively may be severe (e.g., life imprisonment), they are able to inhibit the urge to aggress and enact the behavior in a more planned manner at a later point in time (e.g., as an instrumental homicide)—perhaps with the belief that an arrest for this type of crime is less likely.

In line with the research on general aggression, Woodworth and Porter (2002) found that PCL-R Factor 1 scores, but not Factor 2 scores, contributed to the instrumentality of the homicide. As such, it would appear that while Factor 2 behavioral features may have a more direct and obvious relationship with criminal offending and recidivism (e.g., Walters, 2003), the core emotional–interpersonal traits of psychopathy represented in Factor 1 may better help to explain the motivations that underlie the serious types of violent crimes that psychopathic offenders choose to commit (see also Skeem, Poythress, Edens, Lilienfeld, & Cale, 2003).

Given the evidence for psychopathy as a predictor of aggression in various forms, the role of psychopathy in domestic violence and homicides, which go unreported more often than other violent offenses, also warrants consideration (Holtzworth-Munroe & Stuart, 1994; Juodis, Starzomski, Porter, & Woodworth, 2014a). Indeed, psychopathy has been shown to be a predictor of severe and repeated violence against female intimate partners and is included in a number of scales designed to index risk for domestic violence (e.g., Hilton, Harris, Rice, Houghton, & Eke, 2008; Kropp, Hart, Webster, & Eaves, 1999). To explore the role of psychopathy in this type of aggression more thoroughly, two of us (Porter and Woodworth) conducted a study (Juodis, Starzomski, Porter, & Woodworth, 2014b) comparing the criminal profiles and psychological characteristics of individuals who had committed domestic homicides (DHs; N = 37) to those who had committed nondomestic homicides (NDHs; N = 78). A comparison of psychopathy scores revealed that the DH group scored significantly lower on the PCL-R as a whole and on both its factors than the NDH group. However, it should be noted that offenders in both groups scored quite high on the PCL-R compared to nonoffender groups. In addition, a comparison of motivations for commission of murder revealed that the DH group's violence was more reactive than that of the NDH offenders, although the DH group did show some elements of instrumental violence. When instrumental motivations were present, the DH group was more likely to have been incentivized by revenge or competition over a mate rather than by obtainment of money or drugs. As domestic homicides were more likely to be reactive, psychopathy scores were not as predictive of this type of violence, further supporting the link between psychopathy and instrumental motivations for aggression.

### Self-Gratifying Aspects of Aggression by Psychopathic Individuals

The foregoing discussion establishes that psychopathic offenders are more likely than nonpsychopathic offenders to engage in serious, aggressive acts for instrumental gain. Their violence can simply be a ruthless means to an end. However, recent research indicates that psychopathic offenders may derive gratification or enjoyment from their violent behavior. Analyses of their sexual violence, in particular, suggest that both thrill-seeking and sadistic interests may play an important role in psychopathic crime.

### **Evidence for a Thrill-Seeking Motivation**

It has been long recognized that psychopathic individuals are thrill seekers and that this proclivity may play a role in the crimes they commit (Hare, 1993), especially those involving sexual violence. As with other forms of crime, psychopathy is associated with an increased risk for sexual aggression and recidivism (Coid & Yang, 2011; Hawes et al., 2013; Kosson, Kelly, & White, 1997; Quinsey, Rice, & Harris, 1995). Furthermore, psychopathy is associated with particular types of sexual violence and particular types of target victims. Relevant research suggests that psychopathic individuals who commit crimes of this type are both opportunists and thrill seekers in their sexual offending. For example, in a study of 456 sexual offenders, Forth and Kroner (1995) found that psychopathic rapists were more opportunistic in their offending than their nonpsychopathic counterparts. In both adolescent and adult offenders, psychopathy is associated with higher levels of violence in the commission of sexual offenses (e.g., Gretton, McBride, Lewis, O'Shaughnessy, & Hare, 1994), consistent with a thrill-seeking motivation (Porter, Campbell, Woodworth, & Birt, 2001; see also Hare, 1993).

If thrill seeking motivates high-psychopathic individuals to commit sexual offenses, one might expect such individuals to select a wider range of victims than other offenders, who often "specialize" (especially paraphilic offenders). To evaluate this hypothesis, Porter and colleagues (2000) reviewed both the criminal records and PCL-R scores of a large sample of incarcerated Canadian offenders. They found a remarkably high base rate of psychopathy (64%) among those offenders who had targeted both child and adult victims. The base rate of psychopathy in the mixed-offense group was higher than the prevalence in both rapist (35.9%) and child molester groups (fewer than 10%). Moreover, an unpublished analysis of data from this study revealed that the presence of psychopathy was associated with higher recidivism and poorer conditional release performance for all groups (mixed offenders, rapists, and molesters). Woodworth, Freimuth, and colleagues (2013) further addressed this "nonspecialist" hypothesis in a separate sample of high-risk offenders and found a similar result, namely, that the presence of psychopathy predicted victim type, with highpsychopathy scorers more likely to commit a wide variety of sexually violent offenses and unlikely to be exclusively child molesters (i.e., only 9%, compared to 67% of low-psychopathy scorers). Also consistent with this, Rice and Harris (1997) found that offenders with multiple victim types showed the fastest rate of violent recidivism following release from custody. These findings suggest that psychopathic offenders, who are lacking in emotional sensitivity and attachment, can readily move to a different victim type when the opportunity presents itself, or when they become "bored," as one offender in Porter and colleagues' (2000, p. 229) study reported.

Additional research is needed to more fully examine the degree to which thrill seeking operates as a motivator for psychopathic violence. In particular, there has been little work to date addressing thrill seeking as a factor contributing to nonsexual violence, or evaluating the possibility of an interaction between thrill seeking and instrumental aggression in promoting such behavior (although see Camp and colleagues [2013], cited earlier in this chapter, for an analysis of interplay between disinhibition and instrumentality).

### **Evidence for a Sadistic Motivation**

The term "sadism" has been used to characterize a range of cognitions and behaviors associated with the derivation of pleasure from infliction of physical or emotional pain on another person (Mokros, Schilling, et al., 2014; Porter, Woodworth, Earle, Drugge, & Boer, 2003; Woodworth et al., 2013). Some authors have argued for a link between psychopathy and sadism (e.g., Hart & Hare, 1997; Woodworth, Freimuth, et al., 2013). According to Krafft-Ebing's (1898/1965) classic monograph Psychopathia Sexualis, sadistic violence requires both sexual and personality pathology ("lust and cruelty") in the perpetrator. In his view, many individuals who experience sadistic impulses do not act on them for "moral" reasons. Others who lack morality act on such impulses and derive enjoyment from perpetrating their violent acts. This consideration of both sexual and nonsexual elements in understanding sadism has continued in the psychiatric literature. Historically, the term "sadism" has referred to both a pathological personality structure (sadistic personality disorder in earlier editions of the Diagnostic and Statistical Manual of Mental Disorders [e.g., DSM-IV; American Psychiatric Association (APA), 1994]) and pathological sexual functioning (sexual sadism). Today, only sexual sadism disorder, categorized as a paraphilic disorder, remains in DSM-5 (APA, 2013).

Despite the removal of sadistic personality disorder from the DSM, research has continued to address the possibility of a link between psychopathy and sadistic tendencies (Hare, Cooke, & Hart, 1999; Holt, Meloy, & Strack, 1999; Meloy, 2000; Mokros, Osterheider, Hucker, & Nitschke, 2011; Robertson & Knight, 2014). Using the Aggressive/Sadistic subscale of the Millon Clinical Multiaxial Inventory (MCMI-II; Millon, Davis, & Millon, 1997), along with relevant items from the Personality Disorder Examination (Loranger, Susman, Oldham, & Russakoff, 1987) to assess for sadistic personality traits, and the PCL-R to assess for psychopathy, Holt and colleagues (1999) found that such traits were more common among violent psychopathic offenders than violent nonpsychopathic offenders in a maximum security prison. Violent and sexually violent offenders did not differ in their level of sadistic personality traits, leading the authors to argue that the traits were not tied specifically to sexual pleasure.

Elsewhere, Robertson and Knight (2014) examined the relationship between general measures of sadism and psychopathy at the facet level, and found that a variety of measures of sadism (e.g., self-report scales, file review of past crimes) correlated with total scores on the PCL-R and scores on Facets 1 and 4. Consistent with this, Woodworth, Freimuth, and colleagues (2013) reported that participants from a large sample of high-risk sexual offenders who showed elevated PCL-R psychopathy scores were significantly more likely to have a sadistic paraphilia than participants who exhibited either low or moderate psychopathy scores. Furthermore, other studies have found higher PCL-R scores to be associated with sexual arousal in response to deviant visual and auditory stimuli. Specifically, available data indicate a significant but modest correlation (.21-.28) between PCL-R total scores and deviant sexual arousal (Barbaree, Seto, Serin, Amos, & Preston, 1994; Knight, 2010; Quinsey et al., 1995; Serin, Malcolm, Khanna, & Barbaree, 1994).

Considering the reliable statistical relationship between these two constructs, Mokros and colleagues (2011) evaluated whether psychopathy as indexed by items of the PCL-R and sadism as indexed by diagnostic criteria from DSM-IV-TR (APA, 2000) and the 10th edition of the International Classification of Diseases (ICD-10; World Health Organization, 2004) share a sufficient number of defining features that they can be considered the same construct. Based on analyses of data for a sample of 100 male sex offenders (50% of whom were considered sadistic), they concluded that psychopathy and sadism are distinct constructs, and that specific features of PCL-R psychopathy, such as the deficient affect (Facet 2) features, are actually predictive of sadistic behavior.

As with instrumental aggression, an examination of the crime of homicide specifically may shed light on the nature of sadistic violence by psychopathic offenders. A sexual homicide is one that includes sexual activity before, during, or after the commission of the crime. Unlike murderers in general (see Porter, Campbell, et al., 2001), sexual murderers are more likely than other violent offenders to be psychopathic. For example, Meloy (2000) found that about two-thirds of a sample of adult sexual homicide offenders scored in the moderate to high range on the PCL-R. Similar high levels of psychopathic traits are seen in adolescent sexual homicide offenders (Myers & Blashfield, 1997).

Research examining offender behaviors exhibited in the context of sexual homicide has the potential to provide insight into the link between psychopathy and homicidal behavior of this type. Porter and colleagues (2003) tested for a relationship between PCL-R scores and types of aggression evident during perpetration of crimes by 38 Canadian sexual murderers. The main source of information regarding crimes was the detailed file description contained in each offender's Criminal Profile Report, distilled from police, forensic/ autopsy, and court records. "Gratuitous violence" was defined as excessive violence that goes beyond the level necessary to complete the homicide, such as torture, beating, mutilation, and the use of multiple weapons. Evidence that the offender obtained enjoyment or pleasure from the violent acts, based on self-report information or evidence from the crime scene, was coded as "sadistic violence." Most offenders (84.7%) scored in the moderate to high range on the PCL-R (significantly higher than those of a group of nonsexual murderers). More importantly, homicides committed by psychopathic offenders (n = 18) showed significantly higher level of both gratuitous and sadistic violence than those committed by nonpsychopathic offenders (n = 20). Most psychopathic offenders (82.4%) had committed sadistic acts against their victims, compared to 52.6% of the nonpsychopathic offenders. In examining the offender files, it became clear that for offenders who scored low in psychopathy, the homicide was intended to prevent the victim from reporting a sexual assault and did not serve the same "psychological function" that it seemed to for psychopathic offenders.

In addition to sadistic inclinations that appear to contribute to the motivation for psychopathic offenders to commit aggressive acts, enjoyment of the suffering of others may manifest in other, less violent ways. One of these is schadenfreude, a malicious form of pleasure that is experienced from another's misfortune (Heider, 1958), which refers to enjoyment derived from a psychological distance; the individual who experiences schadenfreude merely observes the harm to the target rather than inflicting/perpetrating it themselves. The relationship between psychopathy, other traits from the so-called "Dark Triad" (narcissism, Machiavellianism; Paulhus & Williams, 2002), and schadenfreude was evaluated by Porter, Bhanwer, Woodworth, and Black (2013) using subjective (self-report) and objective (smile presence and intensity) measures. Student participants in this study (N = 120) were randomly assigned to one of three priming conditions: empathy, schadenfreude, or neutral. After reading a vignette intended as a prime for one of the three emotional states, the participant was exposed to an image of an unfortunate event experienced by the individual described in the vignette. Results indicated that higher psychopathy scores (as measured by Paulhus, Neumann, Hare, Williams, & Hemphill's [2016] Self-Report Psychopathy Scale) were related to increased self-reported schadenfreude across all conditions, even after being primed to feel empathy. Furthermore, those scoring higher on psychopathy were more likely to show observable cues of pleasure to the images, in the form of increased smiling and laughing. Proyer, Flisch, Tschupp, Platt, and Ruch (2012) explored the relationship between psychopathy as assessed by self-report (Köhler, Hinrichs, & Huchzermeier, 2006) and various forms of humor, and found that participants with elevated psychopathic traits were more likely to endorse harming others by directing laughter toward them (i.e., to enjoy laughing at others, termed "katagelasticism"). The authors postulated that psychopathic offenders may use this negative, adversarial form of humor as a tool for control and manipulation (see also Veselka, Schermer, Martin, & Vernon, 2010).

Collectively, these findings suggest that highpsychopathy offenders are more likely than other offenders to derive pleasure from the suffering of others. The sadistic behavior perpetrated by psychopathic offenders could relate to a thrill-seeking motive or sexual sadism, or both. Our hypothesis is that behavior of this type reflects a generalized tendency toward callousness and thrill seeking (see Porter, Campbell, et al., 2001). Although there is a lack of specific research in this area, it seems likely that the combination of these characteristics in psychopathic individuals (in particular, the thrill-seeking motivation) would place such individuals at elevated risk for perpetration of serial homicide—particularly of the predatory sexual variety.

### Self-Directed Aggression

Does the propensity of psychopathic offenders to perpetrate violence against others extend to selfdirected aggression, such as suicidal behaviors? Given the superficial affect, self-promoting tendencies, and grandiosity associated with psychopathy, such behavior may seem highly unlikely. As noted by Cleckley (1976), perhaps psychopathic individuals never or rarely become sufficiently distressed to commit suicide. However, he observed that these individuals frequently make empty threats of self-harm and engage in many bogus attempts characterized by "remarkable cleverness, premeditation, and histrionics" (p. 221). According to this view, self-directed aggression by psychopaths may occur, but it is likely to be instrumental and nonlethal, unlike the self-directed aggression exhibited by individuals with "internalizing" problems (e.g., major depression).

The first published study to examine the relationship between PCL-R psychopathy and selfharm behavior was one by Verona, Patrick, and Joiner (2001). Using data from a sample of 313 adult male prisoners, these investigators found a small but significant correlation (r = .11) between overall PCL-R scores and a history of suicidal behaviors, as determined from diagnostic interview and prison file information. This association, evident also for antisocial personality disorder diagnoses, was attributable entirely to the impulsiveantisocial (Factor 2) features of psychopathy, with no relationship evident for Factor 1 scores. These contrasting associations for the two PCL-R factors with risk for suicide were replicated by Douglas and colleagues (2008) in a separate sample of male prisoners, and by Verona, Hicks, and Patrick (2005) in a female prisoner sample, wherein Factor 1 showed a significant negative association with suicide history (i.e., opposite to that for Factor 2).

Notably, the previously mentioned male offender study by Douglas and colleagues (2008) included scores for the PPI as well as the PCL-R, and the two PPI factors showed even more pronounced opposing relationships with suicidal behavior (i.e., positive for SCI, negative for FD) than the two PCL-R factors. Smith, Selwyn, Wolford-Clevenger, and Mandracchia (2014) reported that court-referred males with higher scores on Factor 2 psychopathy features, as indexed by the Secondary subscale of the SRP, were more likely to be multiple suicide attempters versus single- or nonattempters, whereas scores on the SRP Primary subscale showed no association with suicide history. Those with high scores on the Secondary subscale were also more likely to exhibit comorbid psychological disorders, and the co-occurrence of secondary psychopathic traits with depression was associated in particular with elevated suicidal ideation.

Further research is needed to clarify the psychopathy-self-aggression relationship by coding self-harm incidents in terms of severity and motivation. Although existing research at this time suggests that self-harm is related mainly to impulsive-antisocial (Factor 2) features of psychopathy, as assessed by different inventories, it may be the case that offenders who exemplify the affective-interpersonal features of psychopathy engage in selfharmful behavior that is insincere and enacted to manipulate others (as an expression of tendencies toward lying, conning, and glib persuasiveness). Indeed, Cleckley's (1976) case histories of psychopathic patients included mention of manipulative acts of self-harm, and our own experiences with offenders in prison settings corroborate these impressions. For example, while working as a psychologist in a federal prison, Porter was told bluntly by a psychopathic offender that he had cut his wrists in a feigned suicide attempt, with the aim of getting transferred to a more hospitable prison setting that included a psychiatric treatment center.

### Violence from the Psychopath's Perspective

Asking a psychopathic individual to provide his or her view on violence is unlikely to elicit an honest response. Individuals of this sort have long have been characterized as having a remarkable disregard for the truth (Cleckley, 1976; Hare, 1993, 1998; Meloy, 1988; Porter, Birt, Yuille, & Hervé, 2001), to the extent that deceit often is regarded as a defining characteristic of the disorder. A small number of empirical studies have also demonstrated a link between psychopathy and deceptive behavior (e.g., Lykken, 1957; Rogers et al., 2002; Seto, Khattar, Lalumière, & Quinsey, 1997; Spidel, Hervé, Greaves, & Yuille, 2011). Because high-psychopathic individuals are known to lie frequently, recent studies have examined the perspective of these individuals on violence through less direct/ more subtle means. One line of research has employed verbal stimuli to examine whether highpsychopathic offenders view violence in a negative light. A second line of work has shown that offenders of this type use deception and minimize their role when they describe their violence, even in the context of a confidential research interview.

According to one view, psychopathic individuals are more likely to engage in instrumental acts of aggression because they do not interpret their victims' emotional distress cues or violence as aversive (Blair, 2001; Kirsch & Becker, 2007; Miller, Rausher, Hyatt, Maples, & Zeichner, 2014; see also Nestor, Kimble, Berman, & Haycock, 2002). In line with this hypothesis, a study by British researchers Gray, MacCulloch, Smith, Morris, and Snowden (2003) provides evidence that psychopathic offenders who have committed homicide may not view violence as unpleasant. These investigators measured implicit beliefs about murder in offenders assessed for psychopathy using the PCL-R who had committed murder versus other types of offenses only. Within a modified Implicit Association Test (IAT), participants were presented with words that they were instructed to associate with being either "unpleasant" or "pleasant," and either "peaceful" or "violent." Word stimuli included violent-offense-related words, unpleasant words of other types, words related to the concept of peace, and other pleasant words. In general, control (nonoffender) participants completing this task take longer to respond to word stimuli with a right or left button press when words of contrasting valences require responses with the same button (e.g., Greenwald, McGhee, & Schwartz, 1998). For example, when the same response key is assigned for positively and negatively valent words, control participants usually find the task to be more difficult, as evidenced by longer response times. Gray and colleagues (2003) found that murderers high in PCL-R psychopathy did not display the same impairment in response time as those low in psychopathy when incongruent pleasant and violent words called for equivalent responses; that is, they responded as if they did not associate violence with unpleasantness, and showed diminished negative reactions to violent words compared with nonpsychopathic murderers. Similar implicit cognitive testing with college samples assessed using self-report measures of psychopathy and other Dark Triad traits has shown complementary trends, with individuals scoring high on such measures more likely to attend to violent words (e.g., "murder," "hurt") and process these words in a manner similar to other emotion words (e.g., "sadness," "empathy") and control words (e.g., "chair," "luggage"). Work of this kind provides further support for aberrant cognitive–emotional processing of violence-related stimuli among individuals with psychopathic tendencies (Black & Libben, 2014).

In other work, Porter and Woodworth (2007) addressed this issue by examining the manner in which offenders diagnosed as psychopathic using the PCL-R describe their violent crimes. Following an interview that asked about the violent crime for which the participant was convicted, naive coders rated both the offender's version and official accounts of the crime from prison file sources (e.g., police reports) in terms of the instrumentality or reactivity of the offense. When the self-reported and official descriptions of the violent offenses were compared, it was found that psychopathic offenders were significantly more likely than nonpsychopathic offenders to "reframe" the offenses in an exculpating way; that is, high-PCL-R offenders were significantly more likely to downplay the level of instrumentality of their violent behavior, characterizing it as more reactive than the official version of the offense. Furthermore, high PCL-R scorers were significantly more likely than low PCL-R scorers to omit major details of violent homicide offenses. In addition, analyses revealed that the tendency to exaggerate the reactive quality of homicide offenses was strongly related to PCL-R Factor 1 scores, and unrelated to Factor 2 scores. The results of this study add to a growing body of evidence indicating that instrumental violence is related to the Factor 1 interpersonal and affective features of psychopathy, and not to the Factor 2 social deviance-behavioral features (see also Patrick & Zempolich, 1998). Furthermore, it appears that the interpersonal and affective characteristics of psychopathy relate not only to the type of violence used by offenders but also to the manner in which they discuss it.

As considered briefly near the beginning of this chapter, language can be a useful tool for understanding both underlying cognitions and personality traits of individuals scoring high in psychopathy, as well as other deviant personality tendencies (e.g., Gillman, 2014; Hancock, Woodworth, Morrow, McGillivray, & Boochever, 2012; Pennebaker,

2011). To gain a better understanding of the underlying cognitions of the offender sample examined in Porter and Woodworth (2007), Hancock, Woodworth, and Porter (2013) used automated language analysis methods to explore the descriptions of homicides provided by these offenders. Despite their ability to con and manipulate others, it was posited that many aspects of language use operate below the level of conscious control, and that this type of analysis might yield unique information about elements of psychopathic speech not susceptible to modification based on the perceived expectations of the interview. Two systems, Linguistic Inquiry and Word Count (LIWC; Pennebaker, Booth, & Francis, 2011) and Wmatrix (Rayson, 2008), were used to code transcripts for various linguistic patterns and the use of specific word categories. Analyses of the coded data revealed that high PCL-R offenders used more past-tense and fewer presenttense words in their narratives, as well more disfluencies (e.g., "uh" or "um") than low PCL-R offenders, suggesting both psychological distancing and an emotional detachment from their crimes. Furthermore, high-psychopathy offenders used more subordinating conjunctions (indicative of cause-and-effect thinking) such as "because," "since," and "so that," demonstrating that they provided more reasoning for their actions, consistent with greater instrumental motives. Tellingly, high psychopathic participants also were more likely to use language (even within the context of a murder narrative) reflective of material needs and gains, such as references to food, drink, and money. Interestingly, in a recent study, Crossley, Woodworth, Black, and Hare (2016) found that individuals scoring high on self-report measures of psychopathy displayed atypical and problematic patterns in their language in online environments (e.g., chat rooms) but that it hindered, rather than helped, their ability to prey upon others.

Taken together, existing evidence suggests that psychopathic offenders tend to perceive aggression as a useful tool with which to satisfy a selfish need. They view violence "cognitively," as a means to an end, attaching little emotion to such behavior and seeing it as little different from other instrumental acts (see Molenberghs et al., 2014). Exhibiting negligible remorse even years after committing a crime, psychopathic offenders verbally describe their violent actions as being more reactive and less planned than indicated either in official file records or in their own use of specific words reflecting instrumental motives.

### Subtypes of Psychopathy

Clearly, there is considerable variation in the types and amount of aggression committed by individuals exhibiting particular features of psychopathy (affective-interpersonal vs. impulsive-antisocial) to greater or lesser degrees. In observing the wide variations in clinical presentation and behavioral tendencies across psychopathic individuals, some theorists have suggested the existence of subtypes of the disorder. Cleckley (1976) himself questioned the utility of distinguishing psychopathy subtypes, claiming that they potentially could operate to obscure the defining characteristics of psychopathy. However, a coherent body of empirical work has emerged to support the notion that meaningful subtypes can be distinguished, and perhaps contribute to a more refined understanding of psychopathy. As reviewed by Hicks and Drislane (Chapter 13, this volume), it has been suggested that psychopathy can be broken down into two main subtypes: primary and secondary psychopathy. According to classic accounts (e.g., Karpman, 1941), primary psychopathy arises from constitutional deficits rather than psychosocial learning; such individuals display the defining personality characteristics of psychopathy (e.g., grandiosity, lack of guilt or remorse, and callousness) from an early age, and lack capacities for anxiety and prosocial emotions (e.g., guilt and love) that would otherwise prevent them from engaging in extremely callous actions. This subtype ostensibly relates more to the Factor 1 features of psychopathy indexed by the PCL-R, which, as previously discussed, tend to be correlated more with cold-blooded, instrumental, and lethal violence. On the other hand, individuals with secondary psychopathy are characterized as deficient in prosocial emotions and more likely to be anxious; their hostile behavior is believed to arise more from adverse environmental factors and negative life experiences. As such, the behavior of individuals with secondary psychopathy can be viewed as an adaptation to harsh environmental contingencies (e.g., bad parenting) and/or explainable in terms of some pathology or syndrome other than psychopathy (e.g., posttraumatic stress disorder [PTSD]; Blackburn, Logan, Donnelly, & Renwick, 2008). These characteristics relate more closely to Factor 2 features of PCL-R psychopathy, which most researchers have found to be more predictive of risk for reactive violence (e.g., Falkenbach, Stern, & Creevy, 2014; Kolla et al., 2013).

Other researchers have also distinguished different subtypes of psychopathy based on separate

etiological pathways. For example, Porter (1996) proposed that there are two main types of psychopathy with distinct causal bases. He suggested that individuals with primary psychopathy are born with a predisposition to the core interpersonal and affective features of psychopathy that precludes normal emotional development, whereas those with secondary psychopathy acquire the affective deficits associated with psychopathy through exposure to persistent neglect or abuse (or other early traumatic experience) during early childhood. Furthermore, Porter suggested that in the case of secondary psychopathy, this emotional detachment tends to be spurred by dissociation and a more gradual blunting (or shutting down) of emotions. Although conducting effective empirical tests of this theory is difficult, recent innovative research has yielded some support for this theory of secondary psychopathy (see Hicks & Drislane, Chapter 13, this volume).

Over the decade or so since the initial version of this chapter was published, a great deal more research has clarified how primary and secondary variants of psychopathy relate to violent/aggressive behavior. In one of the larger studies conducted to date, Skeem, Johansson, Andershed, Kerr, and Louden (2007) applied the technique of model-based cluster analysis to PCL-R and other data for a sample of 367 prisoners to determine whether specific, theory-driven traits related to behavior patterns and clinical problems would differentiate these subtypes. In line with theory, offenders with primary psychopathy, relative to those with secondary psychopathy, showed lower trait anxiousness and higher psychopathic features but comparable levels of antisocial behavior. Furthermore, secondary psychopathy was associated with greater levels of general pathology (e.g., symptoms of borderline personality disorder and other major mental disorders) and poorer interpersonal functioning. These results have been replicated in community samples (Falkenbach et al., 2014) and in juvenile samples (Kimonis, Skeem, Cauffman, & Dmitrieva, 2011).

In summary, any thorough consideration of the causes and varying expressions of psychopathic aggression should include consideration of psychopathy subtypes, as well as their etiological pathways. Research in this area is growing and should continue to increase, as there is preliminary evidence that these empirically delineated psychopathy subtypes differ in their motives for and typical expressions of aggression.

### Cognitive Ability as a Potential Moderator of the Psychopathy–Violence Association

Why is most of the ruthless conduct of some psychopathic criminals nonviolent, whereas others show a persistent pattern of violence? Perhaps some high psychopathic offenders view aggressive or violent behavior as being more necessary to achieve their goals than do others. As noted earlier, some psychopathic individuals, especially so-called "white-collar" or corporate psychopaths, seem to use physical aggression only rarely, if ever.

A potential moderator of the relationship between psychopathy and violence is intelligence; that is, more intelligent psychopathic individuals may be less inclined to act aggressively because they can use their cognitive resources to devise nonviolent means (e.g., conning and manipulation) to get what they want (Nijman, Merckelbach, & Cima, 2009; Vitacco, Neumann, & Wodushek, 2008). Less intelligent psychopathic individuals may resort to violence to compensate for their inferior abilities to manipulate others through language. As evidence for this, Heilbrun (1982) found that past violent offending in a sample of 168 male prisoners was influenced by the interaction of intellectual level and self-reported psychopathic tendencies: Less intelligent offenders who scored high in psychopathy showed greater likelihood of having a history of impulsive violence than either more intelligent psychopathic offenders or less intelligent nonpsychopathic offenders. In line with this, Heilbrun and Heilbrun (1985) reported that the most dangerous individuals in a sample of 225 offenders were those with the following characteristics: psychopathic, low IQ, socially withdrawn, and history of violence.

While these early studies offered some evidence for intelligence as a moderator of psychopathy and violence, little research has addressed the issue in recent years, presumably due to methodological obstacles. Specifically, highly intelligent psychopathic individuals in society are more likely to succeed in corporate or political circles and/or use violence less frequently and may therefore be less likely to end up in prison. As such, they are less likely to have been studied by clinical researchers to date, who have focused on prison samples in which psychopathic individuals of average or lower intelligence are disproportionately represented.

Another potential issue in this area is that psychopathic individuals with higher cognitive functioning may be as likely to commit violent acts as less intelligent psychopathic individuals but be much less prone to apprehension for such acts. Relevant to this, Ishikawa and colleagues (2001) tested a community sample of 16 "unsuccessful" and 13 "successful" psychopaths (classified based on their PCL-R scores and whether they had incurred criminal convictions) on laboratory measures of autonomic stress reactivity and executive functioning (referring to the capacity for initiation, planning, abstraction, and decision making). Although differing in conviction history, the two groups had engaged in substantial and similar amounts of self-reported criminal behavior, including violent acts. Results from the laboratory assessment indicated that participants in the successful psychopathy group exhibited greater autonomic reactivity to emotional stressors and stronger executive functioning than those in the unsuccessful psychopathy group. The implication is that psychopathic individuals who are able to avoid apprehension and adjudication for their violent acts are those who possess intact capacities for planning and decision making.

### **Psychopathy and Aggression in Other Populations**

In this chapter, we have focused primarily on aspects of aggressive behavior exhibited by incarcerated adult offenders who are high in psychopathic tendencies. However, psychopathy, and the aggressive behavior associated with it, also presents in other samples, including children and civil psychiatric patients.

### Children and Adolescents with Conduct Problems

Although most research on psychopathy has focused on adults, growing evidence suggests that psychopathy is related to aggression much earlier in life (Waschbusch & Willoughby, 2008). In particular, it appears that precursors to psychopathy emerge in early childhood in the form of "callousunemotional" (CU) traits (Frick, Bodin, & Barry, 2000; Frick & Ellis, 1999; Hawes & Dadds, 2005; Lynam, 2002; Porter, 1996), which map closely onto adult psychopathic features (especially Factor 1 features on the PCL-R). To explore this close link with Factor 1 (affective-interpersonal) features, van Baardewijk, Stegge, Bushman, and Vermeiren (2009) assessed the ability of children with CU traits (as indexed by the APSD) to recognize distress in others and whether this influenced their propensity to engage in aggression. Using a two-person white noise blast paradigm, these investigators showed that children rated high on CU traits blasted their partners with white noise more often and continued to aggress after receiving subtle cues of distress from their partners. However, when presented with written descriptions of the partner's distress, children with high CU traits were more likely to stop aggressing. The authors concluded that children with CU traits possess an affective deficit that contributes to their aggressive behavior. Along similar lines, other researchers have found that children with high levels of CU traits are significantly more aggressive (Kimonis, Frick, Muñoz, & Aucoin, 2008; Viding & Kimonis, Chapter 7, this volume).

CU traits, as distinct from impulsive-disinhibitory tendencies that occur in child disruptive disorders more broadly, are associated with a pattern of serious aggressive behavior that can foreshadow a pattern of persistent antisocial and violent behavior throughout childhood, adolescence, and into adulthood (Dodge, 1991; Fite et al., 2010; Frick, 1998; Frick, O' Brien, Wootton, & McBurnett, 1994; Lynam, 2002; Waschbusch et al., 2004). A follow-up study by van Baardewijk and colleagues (2011) examined the stability of psychopathic traits and aggressive behavior affiliated with these traits over 18 months in 159 boys from the Netherlands, assessed initially at ages 9-12 years. These investigators found moderate to high stability for CU traits and related conduct problems across the two time points. Other work has shown that psychopathic traits during adolescence are associated with convictions for violent offenses (Campbell, Porter, & Santor, 2004; Forth, Hart, & Hare, 1990; Forth & Mailloux, 2000; Gretton, McBride, Hare, O'Shaughnessy, & Kumka, 2001), a high level of institutional aggression (Edens, Poythress, & Lilienfeld, 1999; Hicks, Rogers, & Cashel, 2000; Rogers, Johansen, Chang, & Salekin, 1997), and increased violent recidivism (Brandt, Kennedy, Patrick, & Curtin, 1997; Gretton et al., 2001).

The same pattern of instrumental-reactive aggression in adults with psychopathy has also been found in children and adolescents (Frick & Marsee, Chapter 19, this volume; Frick, Ray, Thornton, & Kahn, 2014). Raine and colleagues (2006) reported results from a longitudinal study in which 503 boys were assessed initially for problem behaviors and family variables at age 7, and completed a Reactive Proactive Aggression Questionnaire at age 16, with the mothers also completing Lynam's (1997) Childhood Psychopathy Scale when the boys were age 16. Analyses of the data at age 16 revealed that mother-rated psychopathy was linked to elevated levels of youth-reported aggression in general, and to proactive (instrumental) aggression in particular. Proactive aggression was also related to youth reports of blunted affect and violent offending at age 16. Additionally, prospective analyses revealed that ratings of the use of strongarm tactics and initiation of fights at age 7 predicted elevated psychopathy scores at age 16. These findings provide evidence for a link between early callous–aggressive tendencies and later psychopathy and aggression.

Other recent research has examined relationships between CU traits and aggressive behavior in adolescent females. Cook, Barese, and Dicataldo (2010) found that, similar to males, juvenile females with higher scores on Factor 1 of the PCL-R Youth Version (PCL:YV; Forth, Kosson, & Hare, 2003) engaged in more proactive aggression. Conversely, a comprehensive review of institutional files for juvenile females with psychopathic traits, as indexed by the PCL:YV, revealed that they did not show clear instrumental motivations for their crimes (Hutton & Woodworth, 2014). However, many of these young female offenders had committed more impulsive and spontaneous types of crimes, and it was speculated that the severity of the offenses committed by the youth in this study may not have passed the threshold at which high psychopathy scores have been associated with instrumental-premeditated offending. Consistent with this possibility, supplemental analyses of data from a study by Woodworth, Agar, and Coupland (2013) that considered instrumentality specifically for homicide offenses committed by a large sample of young male and female offenders yielded findings similar to those of Woodworth and Porter (2002), with the vast majority of homicides committed by youth scoring high on the PCL:YV being predominantly or exclusively instrumental in nature. Nonetheless, additional research is needed to more clearly elucidate the relationship among psychopathy, CU traits, and aggressive offense types among adolescents.

Limited research has examined treatment interventions for children with salient CU traits. To date, existing research suggests that interventions are less effective for children who exhibit persisting CU traits (Hawes & Dadds, 2005, 2007). Given that aggression is evident in these children from a young age and that CU traits tend to be stable and long-lasting, further systematic research on effective early interventions is imperative.

### **Psychiatric Patients**

While the base rate of psychopathy in civil psychiatric patients is low relative to the rate for incarcerated criminal offenders (e.g., Douglas, Ogloff, Nicholls, & Grant, 1999), the relationship between psychopathy and aggression extends to this population. Indeed, elevated scores on the PCL-R are predictive of inpatient and community aggression in forensic psychiatric populations (Doyle, Carter, Shaw, & Dolan, 2012; Fullam & Dolan, 2008; Neumann & Hare, 2008). For example, one study of 1,136 psychiatric patients from the Mac-Arthur Violence Risk Assessment project (Skeem & Mulvey, 2001) found that PCL:SV psychopathy scores predicted future acts of serious violence, despite a base rate for psychopathy of only 8% in the participant sample. Over a 1-year follow-up period, 50% of psychopathic patients and 22% of nonpsychopathic patients committed violent acts. As further evidence for linkage between psychopathy and violence, patients in the sample who exhibited violent behavior had a 73% likelihood of scoring higher on psychopathy than patients who did not exhibit violence (see also Douglas et al., 1999).

The effect of psychopathy in predicting future aggression and violent recidivism among patients with schizophrenia (Abushua'leh & Abu-Akel, 2006; Dolan & Davies, 2006; Pedersen, Kunz, Rasmussen, & Elsass, 2010) and other pathologies (Coccaro, Lee, & McCloskey, 2014; Nouvion, Cherek, Lane, Tcheremissine, & Lieving, 2007) has been investigated as well. For example, Bo and colleagues (2013) examined aggression type (instrumental vs. reactive) in relation to comorbid schizophrenia and psychopathy. The criminal histories of 108 patients in a forensic hospital were assessed for frequency and type of violence. Analyses revealed that scores on the PCL-R as a whole, and its two broad factors and four narrower facets, were all related to premeditated instrumental aggression among patients who met criteria for schizophrenia.

Considering a more general sample of forensic psychiatric patients, Laurell, Belfrage, and Hellström (2010) found that only PCL-R Factor 1 (encompassing affective-interpersonal features) was related to instrumental motivations and severity of violence (see also Laurell, Belfrage, & Hellström, 2014). Similarly, Swogger, Walsh, Homaifar, Caine and Conner (2012) examined the relationship between psychopathy and both other- and selfdirected violence among 851 psychiatric patients sampled from inpatient hospitals for the MacArthur Violence Risk Assessment Study. The participants were administered baseline interviews at the hospital and follow-up interviews in the community at approximately 10-week intervals for about 1 year. The results indicated that all four PCL-R facets predicted other-directed violence over this period, but none showed a relationship with selfdirected violence.

In summary, psychopathic features appear to be associated with heightened aggressive behavior in childhood and adolescence, continuing into adulthood. Furthermore, psychopathy is a strong predictor of violent recidivism in both male and female criminal offenders and civil psychiatric patients.

### Conclusion

Available research findings indicate a clear relationship between psychopathy and aggressive behavior. In fact, the case can be made that high-psychopathic individuals commit more nonsanctioned violence than any other members of society. As such, a prominent focus of research over the decade or so since publication of the first edition of this handbook has been on the relationship between psychopathy and types of motivation for aggression. Growing evidence has continued to support our earlier conclusion that violent acts committed by psychopathic individuals are multifaceted, different from those of other offenders, and appear to commence at a remarkably young age, particularly for those high in CU traits. Furthermore, sexual violence by psychopathic offenders in particular appears to be motivated by sadistic interests and thrill-seeking tendencies, and psychopathic murderers are much more likely than other homicide offenders to commit gratuitous and sadistic acts of violence against their victims during a sexual homicide.

Although some aggressive behavior by psychopathic individuals is reactive, such individuals are especially prone to commit premeditated, cold-blooded acts of violence. Furthermore, in line with hypotheses we advanced in the initial (2006) version of this chapter, research findings since then have revealed that distinct symptom subdimensions (factors) or distinct variants (subtypes) of psychopathy are related to different forms of violent behavior. For example, nearly all homicides committed by high-psychopathic individuals appear to be instrumental in nature, and their own descriptive accounts of these incidents are marked by language indicative of instrumental planning and motivation, with an accompanying linguistic pattern indicative of an emotional deficit. The implication is that the violent acts of high-psychopathic offenders are products of a detached, goaldirected orientation more so than an affect-driven impulsive orientation.

Based on evidence from studies of language, psychophysiology, neurology, and behavior, as reviewed in this volume, the overriding problem with psychopathic individuals appears to be their wholly selfish orientation based in a profound emotional deficit. This translates into a pattern of ruthless aggressive and criminal actions. Many important insights have been gained into the nature and bases of psychopathy since the first edition of this handbook, and extensive research now exists on differences in both the structure and functioning of the brains of psychopathic individuals that can help to account for their aberrant behavior. However, a major challenge that remains is for researchers to delineate the specific psychological processes that underlie the aggressive behavior of high-psychopathic individuals and the distinct etiological mechanisms that give rise to these aggression-promoting processes.

### REFERENCES

- Abushua'leh, K., & Abu-Akel, A. (2006). Association of psychopathic traits and symptomatology with violence in patients with schizophrenia. *Psychiatry Research*, 143, 205–211.
- Aharoni, E., & Kiehl, K. A. (2013). Evading justice: Quantifying criminal success in incarcerated psychopathic offenders. *Criminal Justice and Behavior*, 40, 629–645.
- American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: Author.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: Author.
- Anderson, C. A., & Bushman, B. J. (2002). Media violence and the American public revisited. *American Psychologist*, 57, 448–450.
- Arnett, P. A., Smith, S. S., & Newman, J. P. (1997). Approach and avoidance motivation in psychopathic criminal offenders during passive avoidance. *Journal of Personality and Social Psychology*, 72, 1413–1428.
- Babiak, P. (2000). Psychopathic manipulation at work. In C. B. Gacono (Ed.), *The clinical and forensic assess-*

ment of psychopathy: A practitioner's guide (pp. 287– 311). Mahwah, NJ: Erlbaum.

- Babiak, P., & Hare, R. D. (2006). Snakes in suits: When psychopaths go to work. New York: Regan Books/ HarperCollins.
- Babiak, P., Neumann, C. S., & Hare, R. D. (2010). Corporate psychopathy: Talking the walk. Behavioral Sciences and the Law, 28, 174–193.
- Bandura, A. (1983). Psychological mechanisms of aggression. In R. G. Green & E. I. Donnerstein (Eds.), Aggression: Theoretical and empirical views (Vol. 1, pp. 1–40). New York: Academic Press.
- Barbaree, H., Seto, M., Serin, R., Amos, N., & Preston, D. (1994). Comparisons between sexual and nonsexual rapist sub-types. *Criminal Justice and Behavior*, 21, 95–114.
- Barratt, E. S., Stanford, M. S., Dowdy, L., Liebman, M. J., & Kent, T. A. (1999). Impulsive and premeditated aggression: A factor analysis of self-reported acts. *Psychiatry Research*, 86, 163–173.
- Benning, S. D., Patrick, C. J., Hicks, B. M., Blonigen, D. M., & Krueger, R. F. (2003). Factor structure of the psychopathic personality inventory: Validity and implications for clinical assessment. *Psychological As*sessment, 15, 340–350.
- Berkowitz, L. (1983). The experience of anger as a parallel process in the display of impulsive, "angry" aggression. In R. G. Green & E. I. Donnerstein (Eds.), Aggression: Theoretical and empirical views (pp. 103– 134). New York: Academic Press.
- Black, P. J., & Libben, M. (2014, June). Red for revenge: Using a modified Stroop test to assess for processing biases in the Dark Triad of personality. Poster presented at the 75th annual convention of the Canadian Psychological Association, Vancouver, BC, Canada.
- Black, P. J., Woodworth, M., & Porter, S. (2014). The Big Bad Wolf?: The relation between the Dark Triad and the interpersonal assessment of vulnerability. *Personality and Individual Differences*, 67, 52–56.
- Blackburn, R., Logan, C., Donnelly, J. P., & Renwick, S. J. (2008). Identifying psychopathic subtypes: Combining an empirical personality classification of offenders with the Psychopathy Checklist—Revised. *Journal of Personality Disorders*, 22, 604–622.
- Blair, R. J. R. (2001). Neurocognitive models of aggression, the antisocial personality disorders, and psychopathy. Journal of Neurology, Neurosurgery, and Psychiatry, 71, 727–731.
- Blais, J., Solodukhin, E., & Forth, A. E. (2014). A meta-analysis exploring the relationship between psychopathy and instrumental versus reactive violence. *Criminal Justice and Behaviour*, 41, 797–821.
- Blonigen, D. M., Patrick, C. J., Douglas, K. S., Poythress, N. G., Skeem, J. L., Lilienfeld, S. O., et al. (2010). Multimethod assessment of psychopathy in relation to factors of internalizing and externalizing from the Personality Assessment Inventory: The impact of method variance and suppressor effects. *Psychological Assessment*, 22, 96–107.
- Bo, S., Forth, A., Kongerslev, M., Haahr, U., Pedersen, L., & Simonsen, E. (2013). Subtypes of aggression in patients with schizophrenia: The role of psychopathy. Journal of Forensic Psychiatry and Psychology, 24, 496–513.
- Brandt, J. R., Kennedy, W. A., Patrick, C. J., & Curtin, J. J. (1997). Assessment of psychopathy in a population of incarcerated adolescent offenders. *Psychological Assessment*, 9, 429–435.
- Brown, K., Atkins, M. S., Osborne, M. L., & Milnamow, M. (1996). A revised teacher rating scale for reactive and proactive aggression. *Journal of Abnormal Child Psychology*, 24, 473–480.
- Buckels, E. E., Trapnell, P. D., & Paulhus, D. L. (2014). Trolls just want to have fun. Personality and Individual Differences, 67, 97–102.
- Bushman, B. J., & Anderson, C. A. (2001). Is it time to pull the plug on the hostile versus instrumental aggression dichotomy? *Psychological Review*, 108, 273–279.
- Camp, J. P., Skeem, J. L., Barchard, K., Lilienfeld, S. O., & Poythress, N. G. (2013). Psychopathic predators?: Getting specific about the relation between psychopathy and violence. *Journal of Consulting and Clinical Psychology*, 81(3), 467–480.
- Campbell, M. A., Porter, S., & Santor, D. (2004). Psychopathic traits in adolescent offenders: An evaluation of criminal history, clinical, and psychosocial correlates. *Behavioral Sciences and the Law, 22*, 23–47.
- Chase, K. A., O'Leary, K. D., & Heyman, R. E. (2001). Categorizing partner-violent men within the reactive–proactive typology model. *Journal of Consulting* and Clinical Psychology, 69, 567–572.
- Christie, R., & Geis, F. (1970). Studies in Machiavellianism. New York: Academic Press.
- Cima, M., & Raine, A. (2009). Distinct characteristics of psychopathy relate to different subtypes of aggression. Personality and Individual Differences, 47, 835–840.
- Cleckley, H. (1976). *The mask of sanity* (5th ed.). St. Louis, MO: Mosby. (Original work published 1941)
- Coccaro, E. F., Lee, R., & McCloskey, M. S. (2014). Relationship between psychopathy, aggression, anger, impulsivity, and intermittent explosive disorder. Aggressive Behavior, 40(6), 526–536.
- Coid, J., & Yang, M. (2011). The impact of psychopathy on violence among the household population of Great Britain. Social Psychiatry and Psychiatric Epidemiology, 46(6), 473–480.
- Cook, N. E., Barese, T. H., & Dicataldo, F. (2010). The confluence of mental health and psychopathic traits in adolescent female offenders. *Criminal Justice and Behavior*, 37, 119–135.
- Cooke, D. J., & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment*, 13, 171–188.
- Cooke, D., Michie, C., De Brito, S., Hodgins, S., & Sparkes, L. (2011). Measuring life-long patterns of

instrumental aggression: A methodological note. *Psychology, Crime and Law, 17, 319–329.* 

- Cornell, D. G., Warren, J., Hawk, G., Stafford, E., Oram, G., & Pine, D. (1996). Psychopathy in instrumental and reactive violent offenders. *Journal of Consulting* and Clinical Psychology, 64, 783–790.
- Crossley, L., Woodworth, M., Black, P. J., & Hare, R. (2016). The dark side of negotiation: Examining the nuances of face-to-face and computer-mediated negotiations. *Personality and Individual Differences*, 91, 47–51.
- Declercq, F., Willemsen, J., Audenaert, K., & Verhaeghe, P. (2012). Psychopathy and predatory violence in homicide, violent, and sexual offences: Factor and facet relations. *Legal and Criminological Psychology*, 17, 59–74.
- Dempster, R. J., Lyon, D. R., Sullivan, L. E., Hart, S. D., Smiley, W. C., & Mulloy, R. (1996, August). Psychopathy and instrumental aggression in violent offenders. Paper presented at the annual meeting of the American Psychological Association, Toronto, Ontario, Canada.
- Dodge, K. A. (1991). The structure and function of reactive and proactive aggression. In D. J. Pepler & K. H. Rubin (Eds.), *The development and treatment of childhood aggression* (pp. 1–18). Hillsdale, NJ: Erlbaum.
- Dolan, M., & Davies, G. (2006). Psychopathy and institutional outcome in patients with schizophrenia in forensic settings in the UK. Schizophrenia Research, 81, 277–281.
- Douglas, K. S., Lilienfeld, S. O., Skeem, J. L., Poythress, N. G., Edens, J. F., & Patrick, C. J. (2008). Relation of antisocial and psychopathic traits to suicide-related behavior among offenders. *Law and Human Behavior*, 32, 511–525.
- Douglas, K., Ogloff, J., Nicholls, T., & Grant, I. (1999). Assessing risk for violence among psychiatric patients: The HCR-20, Violence Risk Assessment Scheme, and the Psychopathy Checklist: Screening Version. Journal of Consulting and Clinical Psychology, 67, 917–930.
- Doyle, M., Carter, S., Shaw, J., & Dolan, M. (2012). Predicting community violence from patients discharged from acute mental health units in England. Social Psychiatry and Psychiatric Epidemiology, 47, 627–637.
- Drislane, L. E., Patrick, C. J., & Arsal, G. (2014). Clarifying the content coverage of differing psychopathy inventories through reference to the Triarchic Psychopathy Measure. *Psychological Assessment*, 26, 350–362.
- Edens, J. F., Poythress, N. G., & Lilienfeld, S. O. (1999). Identifying inmates at risk for disciplinary infractions: A comparison of two measures of psychopathy. *Behavioral Sciences and the Law*, 17, 435–443.
- Edens, J. F., Poythress, N. G., Lilienfeld, S. O., & Patrick, C. J. (2008a). A prospective comparison of two measures of psychopathy in the prediction of institutional misconduct. *Behavioral Sciences and the Law*, 26, 529–541.

- Edens, J. F., Poythress, N. G., Lilienfeld, S. O., Patrick, C. J., & Test, A. (2008b). Further evidence of the divergent correlates of the Psychopathic Personality Inventory factors: Prediction of institutional misconduct among male prisoners. *Psychological Assessment*, 20(1), 86–91.
- Falkenbach, D., Poythress, N., & Creevy, C. (2008). The exploration of subclinical psychopathic subtypes and the relationship with types of aggression. *Personality and Individual Differences*, 44, 821–832.
- Falkenbach, D., Poythress, N., Falki, M., & Manchak, S. (2007). Reliability and validity of two self-report measures of psychopathy. Assessment, 14, 341–350.
- Falkenbach, D. M., Stern, S. B., & Creevy, C. (2014). Psychopathy variants: Empirical evidence supporting a subtyping model in a community sample. Personality Disorders: Theory, Research, and Treatment, 5, 10–19.
- Fite, P. J., Raine, A., Stouthamer-Loeber, M., Loeber, R., & Pardini, D. A. (2010). Reactive and proactive aggression in adolescent males: Examining differential outcomes 10 years later in early adulthood. Criminal Justice and Behavior, 37, 141–157.
- Flight, J. I., & Forth, A. E. (2007). Instrumentally violent youths: The roles of psychopathic traits, empathy, and attachment. *Criminal Justice and Behavior*, 34, 739–751.
- Forth, A. E., Hart, S. D., & Hare, R. D. (1990). Assessment of psychopathy in male young offenders. Psychological Assessment, 2, 342–344.
- Forth, A. E., Kosson, D. S., & Hare, R. D. (2003). Hare Psychopathy Checklist: Youth Version technical manual. Toronto: Multi-Health Systems.
- Forth, A. E., & Kroner, D. (1995). The factor structure of the Revised Psychopathy Checklist with incarcerated rapists and incest offenders. Unpublished manuscript, Carleton University, Ottawa, Ontario, Canada.
- Forth, A. E., & Mailloux, D. L. (2000). Psychopathy in youth: What do we know? In C. B. Gacono (Ed.), The clinical and forensic assessment of psychopathy: A practitioner's guide (pp. 25–54). Mahwah, NJ: Erlbaum.
- Frick, P. J. (1998). Conduct disorders and severe antisocial behavior. New York: Plenum Press.
- Frick, P. J., Bodin, S. D., & Barry, C. T. (2000). Psychopathic traits and conduct problems in community and clinic-referred samples of children: Further development of the Psychopathy Screening Device. *Psychological Assessment*, 12, 382–393.
- Frick, P. J., & Ellis, M. (1999). Callous–unemotional traits and subtypes of conduct disorder. *Clinical Child* and Family Psychology Review, 2, 149–168.
- Frick, P. J., & Hare, R. D. (2001). Antisocial Process Screening Device: APSD. Toronto: Multi-Health Systems.
- Frick, P. J., O'Brien, B. S., Wootton, J. M., & McBurnett, K. (1994). Psychopathy and conduct problems in children. *Journal of Abnormal Psychology*, 103, 700–707.
- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E.

(2014). Can callous–unemotional traits enhance the understanding, diagnosis, and treatment of serious conduct problems in children and adolescents?: A comprehensive review. *Psychological Bulletin, 140*, 1–57.

- Fullam, R. S., & Dolan, M. C. (2008). Executive function and in-patient violence in forensic patients with schizophrenia. *British Journal of Psychiatry*, 193, 247–253.
- Gillman, L. (2014). You are what you speak: A basic investigation into psychopaths as reflected in linguistic output. Unpublished honour's thesis, University of British Columbia–Okanagan, Okanagan, Canada.
- Gray, N. S., MacCulloch, M. J., Smith, J., Morris, M., & Snowden, R. J. (2003). Violence viewed by psychopathic murderers: Adapting a revealing test may expose those psychopaths who are most likely to kill. *Nature*, 423, 497–498.
- Gray, N. S., & Snowden, R. J. (2016). Psychopathy in women: Prediction of criminality and violence in UK and USA psychiatric patients resident in the community. *Psychiatry Research*, 237, 339–343.
- Greenwald, A. G., McGhee, J. L., & Schwartz, J. L. (1998). Measuring individual differences in implicit cognition: The Implicit Association test. *Journal of Personality and Social Psychology*, 74, 1464–1480.
- Gretton, H. M., McBride, H. L., Hare, R. D., O'Shaughnessy, R., & Kumka, G. (2001). Psychopathy and recidivism in adolescent sex offenders. Criminal Justice and Behavior, 28, 427–449.
- Gretton, H., McBride, M., Lewis, K., O'Shaughnessy, R., & Hare, R. D. (1994, March). Patterns of violence and victimization in adolescent sexual psychopaths. Paper presented at the biennial meeting of the American Psychology and Law Society, Santa Fe, NM.
- Hancock, J., Woodworth, M., & Boochever, R. (2015, January). Understanding psychopathy and social media use with a linguistic lense. Paper presented at the 48th Hawaii International Conference on Systems Science, Kauai, HI.
- Hancock, J., Woodworth, M. T., Morrow, R., McGillivray, H., & Boochever, R. (2012, January). Assessing credibility through text: A preliminary analysis for identifying psychopathy. Paper presented at the 45th Hawaii International Conference on System Sciences, Maui, HI.
- Hancock, J. T., Woodworth, M. T., & Porter, S. (2013). Hungry like the wolf: A word-pattern analysis of the language of psychopaths. *Legal and Criminological Psychology*, 18, 102–114.
- Hare, R. D. (1980). A research scale for the assessment of psychopathy in criminal populations. *Personality* and Individual Differences, 1, 111–119.
- Hare, R. D. (1991). The Hare Psychopathy Checklist—Revised. Toronto: Multi-Health Systems.
- Hare, R. D. (1993). Without conscience: The disturbing world of the psychopaths among us. New York: Simon & Schuster.
- Hare, R. D. (1998). Psychopathy and its nature: Implica-

tions for mental health and criminal justice systems. In T. Millon, E. Simonsen, M. Birkert-Smith, & R. D. Davis (Eds.), *Psychopathy: Antisocial criminal and violent behavior* (pp. 188–212). New York: Guilford Press.

- Hare, R. D. (2003). The Hare Psychopathy Checklist— Revised (2nd ed.). Toronto: Multi-Health Systems.
- Hare, R. D., Black, P. J., & Walsh, Z. (2013). The Psychopathy Checklist—Revised: Forensic applications and limitations. In R. P. Archer & E. A. Wheeler (Eds.), Forensic uses of clinical assessment instruments (2nd ed., pp. 230–265). New York: Routledge/Taylor & Francis Group.
- Hare, R. D., Cooke, D. J., & Hart, S. D. (1999). Psychopathy and sadistic personality disorder. In T. Millon, P. H. Blanney, & R. D. Davies (Eds.), Oxford textbook of psychopathology (pp. 555–584). New York: Oxford University Press.
- Hare, R. D., & Jutai, J. (1983). Criminal history of the male psychopath: Some preliminary data. In K. T. Van Dusen & S. A. Mednick (Eds.), Prospective studies of crime and delinquency (pp. 225–236). Boston: Kluwer-Nijhoff.
- Hare, R. D., & Neumann, C. S. (2010). The role of antisociality in the psychopathy construct: Comment on Skeem and Cooke (2010). *Psychological Assessment*, 22, 446–454.
- Harpur, T. J., & Hare, R. D. (1994). Assessment of psychopathy as a function of age. *Journal of Abnormal Psychology*, 103, 604–609.
- Harris, G., Rice, M., & Quinsey, V. (1993). Violent recidivism of mentally disordered offenders: The development of a statistical prediction instrument. *Criminal Justice and Behavior*, 20, 315–335.
- Harris, G. T., Skilling, T. A., & Rice, M. E. (2001). The construct of psychopathy. In M. Tonry (Ed.), Crime and justice: An annual review of research (pp. 197– 264). Chicago: University of Chicago Press.
- Hart, S., & Dempster, R. (1997). Impulsivity and psychopathy. In C. Webster & M. Jackson (Eds.), Impulsivity: Theory, assessment and treatment (pp. 212– 232). New York: Guilford Press.
- Hart, S. D., & Hare, R. D. (1997). Psychopathy: Assessment and association with criminal behavior. In D. Stoff, J. Breiling, & J. D. Maser (Eds.), *Handbook of antisocial behavior* (pp. 22–35). New York: Wiley.
- Hawes, D. J., & Dadds, M. R. (2005). The treatment of conduct problems in children with callous–unemotional traits. *Journal of Consulting and Clinical Psychology*, 73, 737–741.
- Hawes, D. J., & Dadds, M. R. (2007). Stability and malleability of callous–unemotional traits during treatment for childhood conduct problems. *Journal of Clinical Child and Adolescent Psychology*, 36, 347–355.
- Hawes, S. W., Boccaccini, M. T., & Murrie, D. C. (2013). Psychopathy and the combination of psychopathy and sexual deviance as predictors of sexual recidivism: Meta-analytic findings using the Psychopathy Checklist—Revised. Psychological Assessment, 25, 233–243.

- Hecht, L. K., Berg, J. M., Lilienfeld, S. O., & Latzman, R. D. (2016). Parsing the heterogeneity of psychopathy and aggression: Differential associations across dimensions and gender. *Personality Disorders: Theory*, *Research, and Treatment*, 7, 2–14.
- Heider, F. (1958). The psychology of interpersonal relations. Hoboken, NJ: Wiley.
- Heilbrun, A. B. (1982). Cognitive models of criminal violence based on intelligence and psychopathy levels. *Journal of Consulting and Clinical Psychology*, 50, 546–557.
- Heilbrun, A. B., & Heilbrun, M. R. (1985). Psychopathy and dangerousness: Comparison, integration and extension of two psychopathic typologies. *British Journal of Clinical Psychology*, 24, 181–195.
- Hemphill, J. F., Hare, R. D., & Wong, S. (1998). Psychopathy and recidivism: A review. Legal and Criminological Psychology, 3, 139–170.
- Hemphill, J., Templeman, R., Wong, S., & Hare, R. D. (1998). Psychopathy and crime: Recidivism and criminal careers. In D. Cooke, A. Forth, & R. D. Hare (Eds.), Psychopathy: Theory, research, and implications for society (pp. 374–399). Dordrecht, The Netherlands: Kluwer.
- Hervé, H. M., Mitchell, D., Cooper, B. S., Spidel, A., & Hare, R. D. (2004). Psychopathy and unlawful confinement: An examination of perpetrator and event characteristics. *Canadian Journal of Behavioural Sci*ence, 36, 137–145.
- Hicks, M., Rogers, R., & Cashel, M. L. (2000). Predictions of violent and total infractions among institutionalized male juvenile offenders. *Journal of the American Academy of Psychiatry and the Law, 28*, 183–190.
- Hilton, N. Z., Harris, G. T., Rice, M. E., Houghton, R. E., & Eke, A. W. (2008). An in-depth actuarial assessment for wife assault recidivism: The domestic violence risk appraisal guide. *Law and Human Behavior*, 32, 150–163.
- Holt, S. E., Meloy, J. R., & Strack, S. (1999). Sadism and psychopathy in violent and sexually violent offenders. *Journal of the American Academy of Psychiatry and Law*, 27, 23–32.
- Holtzworth-Munroe, A., & Stuart, G. L. (1994). Treatment of marital violence. In L. VandeCreek, S. Knapp, & T. L. Jackson (Eds.), *Innovations in clinical practice: A source book* (Vol. 13, pp. 5–19). Sarasota, FL: Professional Resource Press/Professional Resource Exchange.
- Hutton, E. L., & Woodworth, M. (2014). Violent female youth: An examination of instrumental violence, psychopathy, and offense characteristics. *Behavioral Sciences and the Law*, 32(1), 121–134.
- Ishikawa, S. S., Raine, A., Lencz, T., Bihrle, S., & LaCasse, L. (2001). Autonomic stress reactivity and executive functions in successful and unsuccessful criminal psychopaths from the community. *Journal* of Abnormal Psychology, 110, 423–432.
- Juodis, M., Starzomski, A., Porter, S., & Woodworth, M. (2014a). A comparison of domestic and non-domes-

tic homicides: Further evidence for distinct dynamics and heterogeneity of domestic homicide perpetrators. *Journal of Family Violence*, 29, 299–313.

- Juodis, M., Starzomski, A., Porter, S., & Woodworth, M. (2014b). What can be done about high-risk perpetrators of domestic violence? *Journal of Family Violence*, 29, 381–390.
- Karpman, B. (1941). On the need of separating psychopathy into two distinct clinical types: The symptomatic and the idiopathic. *Journal of Criminal Psychopathology*, 3, 112–137.
- Kimonis, E. R., Frick, P. J., Muñoz, L. C., & Aucoin, K. J. (2008). Callous–unemotional traits and the emotional processing of distress cues in detained boys: Testing the moderating role of aggression, exposure to community violence, and histories of abuse. *Devel*opment and Psychopathology, 20, 569–589.
- Kimonis, E. R., Skeem, J. L., Cauffman, E., & Dmitrieva, J. (2011). Are secondary variants of juvenile psychopathy more reactively violent and less psychosocially mature than primary variants? *Law and Human Behavior*, 35(5), 381–391.
- Kirsch, L. G., & Becker, J. V. (2007). Emotional deficits in psychopathy and sexual sadism: Implications for violent and sadistic behavior. *Clinical Psychology Re*view, 27, 904–922.
- Knight, R. A. (2010). Is a diagnostic category for paraphilic coercive disorder defensible? Archives of Sexual Behavior, 39, 419–426.
- Köhler, D., Hinrichs, G., & Huchzermeier, C. (2006). The Kiel Psychopathy Inventory (KPI-R). Kiel, Germany: University of Kiel.
- Kolla, N. J., Malcolm, C., Attard, S., Arenovich, T., Blackwood, N., & Hodgins, S. (2013). Childhood maltreatment and aggressive behaviour in violent offenders with psychopathy. *Canadian Journal of Psychiatry*, 58, 487–494.
- Kosson, D. S., Kelly, J. C., & White, J. W. (1997). Psychopathy-related traits predict self-reported sexual aggression among college men. *Journal of Interper*sonal Violence, 12, 241–254.
- Krafft-Ebing, R. V. (1965). Psychopathia sexualis (H. Wedeck, Trans.). New York: Putnam. (Original work published 1898)
- Kropp, P. R., Hart, S. D., Webster, C. D., & Eaves, D. (1999). Spousal assault risk assessment guide. North Tonawanda, NY: Multi-Health Systems.
- Laurell, J., Belfrage, H., & Hellström, Å. (2010). Facets on the Psychopathy Checklist Screening Version and instrumental violence in forensic psychiatric patients. Criminal Behaviour and Mental Health, 20(4), 285–294.
- Laurell, J., Belfrage, H., & Hellström, Å. (2014). Deceptive behaviour and instrumental violence among psychopathic and non-psychopathic violent forensic psychiatric patients. Psychology, Crime, and Law, 20, 467–479.
- LeBreton, J. M., Baysinger, M. A., Abbey, A., & Jacques-Tiura, A. J. (2013). The relative importance of psychopathy-related traits in predicting impersonal sex

and hostile masculinity. Personality and Individual Differences, 55(7), 817–822.

- Leistico, A. R., Salekin, R. T., DeCoster, J., & Rogers, R. (2008). A large-scale meta-analysis relating the Hare measures of psychopathy to antisocial conduct. *Law* and Human Behavior, 32(1), 28–45.
- Levenson, M. R., Kiehl, K. A., & Fitzpatrick, C. M. (1995). Assessing psychopathic attributes in a noninstitutionalized population. *Journal of Personality and Social Psychology*, 68, 151–158.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment*, 66(3), 488–524.
- Lilienfeld, S. O., & Widows, M. R. (2005). Psychopathic Personality Inventory—Revised: Professional manual. Lutz, FL: Professional Assessment Resources.
- Loranger, A. W., Susman, V. L., Oldham, J. M., & Russakoff, L. M. (1987). The Personality Disorder Examination: A preliminary report. *Journal of Personality Disorders*, 1, 1–13.
- Lykken, D. T. (1957). A study of anxiety in the sociopathic personality. *Journal of Abnormal and Social Psychology*, 55, 6–10.
- Lynam, D. R. (1997). Pursuing the psychopath: Capturing the fledgling psychopath in a nomological net. *Journal of Abnormal Psychology*, 106(3), 425–438.
- Lynam, D. R. (2002). Fledgling psychopathy: A view from personality theory. Law and Human Behavior, 26, 255–259.
- Marcus, D. K., & Norris, A. L. (2014). A new measure of attitudes toward sexually predatory tactics and its relation to the triarchic model of psychopathy. *Journal* of Personality Disorders, 28, 247–261.
- Meloy, J. R. (1988). The psychopathic mind: Origins, dynamics, and treatments. Northvale, NJ: Jason Aronson.
- Meloy, J. R. (2000). The nature and dynamics of sexual homicide: An integrative review. Aggression and Violent Behavior, 5, 1–22.
- Miller, J. D., Rausher, S., Hyatt, C. S., Maples, J., & Zeichner, A. (2014). Examining the relations among pain tolerance, psychopathic traits, and violent and nonviolent antisocial behavior. *Journal of Abnormal Psychology*, 123, 205–213.
- Millon, T., Davis, R. D., & Millon, C. (1997). MCMI-III manual (2nd ed.). Minneapolis, MN: National Computer Systems.
- Mokros, A., Osterheider, M., Hucker, S. J., & Nitschke, J. (2011). Psychopathy and sexual sadism. Law and Human Behavior, 35(3), 188–199.
- Mokros, A., Schilling, F., Weiss, K., Nitschke, J., & Eher, R. (2014). Sadism in sexual offenders: Evidence for dimensionality. *Psychological Assessment*, 26, 138– 147.
- Mokros, A., Vohs, K., & Habermeyer, E. (2014). Psychopathy and violent reoffending in German-speaking countries: A meta-analysis. European Journal of Psychological Assessment, 30, 117–129.

- Molenberghs, P., Bosworth, R., Nott, Z., Louis, W. R., Smith, J. R., Amiot, C. E., et al. (2014). The influence of group membership and individual differences in psychopathy and perspective taking on neural responses when punishing and rewarding others. *Human Brain Mapping*, 35, 4989–4999.
- Monahan, J. (2006). [Comments on book jacket]. In C. J. Patrick (Ed.), Handbook of psychopathy. New York: Guilford Press.
- Myers, W. C., & Blashfield, R. (1997). Psychopathology and personality in juvenile sexual homicide offenders. Journal of the American Academy of Psychology and Law, 25, 497–508.
- Nestor, G., Kimble, M., Berman, I., & Haycock, J. (2002). Psychosis, psychopathy, and homicide: A preliminary neuropsychological inquiry. *American Journal of Psychiatry*, 159, 138–140.
- Neumann, C. S., & Hare, R. D. (2008). Psychopathic traits in a large community sample: Links to violence, alcohol use, and intelligence. *Journal of Consulting and Clinical Psychology*, 76, 893–899.
- Newman, J. P., & Wallace, J. F. (1993). Psychopathy. In P. C. Kendall & K. L. Ronnins (Eds.), Psychopathology and cognition (pp. 293–349). New York: Academic Press.
- Nicholls, T. L., Ogloff, J. P., Brink, J., & Spidel, A. (2005). Psychopathy in women: A review of its clinical usefulness for assessing risk for aggression and criminality. *Behavioral Sciences and the Law*, 23, 779–802.
- Nijman, H., Merckelbach, H., & Cima, M. (2009). Performance intelligence, sexual offending and psychopathy. *Journal of Sexual Aggression*, 15, 319–330.
- Nouvion, S. O., Cherek, D. R., Lane, S. D., Tcheremissine, O. V., & Lieving, L. M. (2007). Human proactive aggression: Association with personality disorders and psychopathy. Aggressive Behavior, 33, 552–562.
- Ostrov, J. M., & Houston, R. J. (2008). The utility of forms and functions of aggression in emerging adulthood: Association with personality disorder symptomatology. *Journal of Youth and Adolescence*, *37*, 1147–1158.
- Pardini, D. A., Lochman, J. E., & Frick, P. J. (2003). Callous/unemotional traits and social-cognitive processes in adjudicated youths. *Journal of the American Academy of Child and Adolescent Psychiatry*, 42, 364–371.
- Patrick, C. J., Edens, J. F., Poythress, N., Lilienfeld, S. O., & Benning, S. D. (2006). Construct validity of the PPI two-factor model with offenders. *Psychological Assessment*, 18, 204–208.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, 21, 913–938.
- Patrick, C. J., & Zempolich, K. A. (1998). Emotion and aggression in the psychopathic personality. Aggression and Violent Behavior, 3, 303–338.

Paulhus, D. L., Neumann, C. S., Hare, R. D., Williams,

K. M., & Hemphill, J. F. (2016). Self-Report Psychopathy Scale (4th ed.). Toronto: Multi-Health Systems.

- Paulhus, D. L., & Williams, K. M. (2002). The dark triad of personality: Narcissism, Machiavellianism and psychopathy. *Journal of Research in Personality*, 36, 556–563.
- Pedersen, L., Kunz, C., Rasmussen, K., & Elsass, P. (2010). Psychopathy as a risk factor for violent recidivism: Investigating the Psychopathy Checklist Screening Version (PCL:SV) and the Comprehensive Assessment of Psychopathic Personality (CAPP) in a forensic psychiatric setting. International Journal of Forensic Mental Health, 9, 308–315.
- Pennebaker, J. W. (2011). The secret life of pronouns: What our words say about us. New York: Bloomsbury Press.
- Pennebaker, J. W., Booth, R. J., & Francis, M. E. (2011). LIWC2007: Linguistic Inquiry and Word Count (Version 1.12) [Computer software]. Retrieved from liwc. net.
- Porter, S. (1996). Without conscience or without active conscience?: The etiology of psychopathy revisited. Aggression and Violent Behavior, 1, 179–189.
- Porter, S., Bhanwer, A., Woodworth, M., & Black, P. J. (2013). Soldiers of misfortune: An examination of the Dark Triad and the experience of schadenfreude. *Personality and Individual Differences*, 67, 64–68.
- Porter, S., Birt, A. R., & Boer, D. P. (2001). Investigation of the criminal and conditional release histories of Canadian federal offenders as a function of psychopathy and age. *Law and Human Behavior*, 25, 647–661.
- Porter, S., Birt, A. R., Yuille, J. C., & Hervé, H. (2001). Memory for murder: A psychological perspective on dissociative amnesia in forensic contexts. *International Journal of Law and Psychiatry*, 24, 23–42.
- Porter, S., Campbell, M. A., Woodworth, M., & Birt, A. R. (2001). A new psychological conceptualization of the sexual psychopath. In F. Columbus (Ed.), Advances in psychology research (Vol. 7, pp. 21–36). New York: Nova Science.
- Porter, S., Fairweather, D., Drugge, J., Hervé, H., Birt, A. R., & Boer, D. P. (2000). Profiles of psychopathy in incarcerated sexual offenders. *Criminal Justice and Behavior*, 27, 216–233.
- Porter, S., & Woodworth, M. (2007). "I'm sorry I did it... but he started it": A comparison of the official and self-reported homicide descriptions of psychopaths and non-psychopaths. Law and Human Behavior, 31, 91–107.
- Porter, S., Woodworth, M., Earle, J., Drugge, J., & Boer, D. P. (2003). Characteristics of violent behavior exhibited during sexual homicides by psychopathic and non-psychopathic murderers. *Law and Human Behavior*, 27, 459–470.
- Proyer, R. T., Flisch, R., Tschupp, S., Platt, T., & Ruch, W. (2012). How does psychopathy relate to humor and laughter?: Dispositions toward ridicule and being laughed at, the sense of humor, and psychopathic

personality traits. International Journal of Law and Psychiatry, 35, 263–268.

- Pulkkinen, L. (1996). Proactive and reactive aggression in early adolescence as precursors to anti- and prosocial behaviors in young adults. *Aggressive Behavior*, 22, 241–257.
- Quinsey, V. L., Rice, M. E., & Harris, G. T. (1995). Actuarial prediction of sexual recidivism. *Journal of In*terpersonal Violence, 10, 85–105.
- Raine, A., Dodge, K., Loeber, R., Gatzke-Kopp, L., Lynam, D., Reynolds, C., et al. (2006). The Reactive–Proactive Aggression Questionnaire: Differential correlates of reactive and proactive aggression in adolescent boys. Aggressive Behavior, 32, 159–171.
- Rayson, P. (2008). Wmatrix: A web-based corpus processing environment. Retrieved from http://ucrel. lancs.ac.uk/wmatrix.
- Reidy, D. E., Shelley-Tremblay, J. F., & Lilienfeld, S. O. (2011). Psychopathy, reactive aggression, and precarious proclamations: A review of behavioral, cognitive, and biological research. Aggression and Violent Behavior, 16, 512–524.
- Reidy, D. E., Zeichner, A., & Martinez, M. A. (2008). Effects of psychopathy traits on unprovoked aggression. Aggressive Behavior, 34, 319–328.
- Reidy, D. E., Zeichner, A., Miller, J. D., & Martinez, M. A. (2007). Psychopathy and aggression: Examining the role of psychopathy factors in predicting laboratory aggression under hostile and instrumental conditions. *Journal of Research in Personality*, 41, 1244–1251.
- Reidy, D. E., Zeichner, A., & Seibert, L. (2011). Unprovoked aggression: Effects of psychopathic traits and sadism. *Journal of Personality*, 79, 75–100.
- Rice, M. E., & Harris, G. T. (1997). Cross-validation and extension of the Violence Risk Appraisal Guide for child molesters and rapists. *Law and Human Behavior*, 21, 231–241.
- Robbins, P., Monahan, J., & Silver, E. (2003). Mental disorder, violence, and gender. Law and Human Behavior, 27, 561–571.
- Robertson, C. A., & Knight, R. A. (2014). Relating sexual sadism and psychopathy to one another, nonsexual violence, and sexual crime behaviors. Aggressive Behavior, 40, 12–23.
- Rogers, R., Johansen, J., Chang, J. J., & Salekin, R. (1997). Predictors of adolescent psychopathy: Oppositional and conduct-disorders symptoms. *Journal* of the American Academy of Psychiatry and Law, 25, 261–270.
- Rogers, R., Vitacco, M. J., Jackson, R. L., Martin, M., Collins, M., & Sewell, K. W. (2002). Faking psychopathy?: An examination of response styles with antisocial youth. *Journal of Personality Assessment*, 78, 31–46.
- Salekin, R. T., Rogers, R., & Sewell, K. W. (1996). A review and meta-analysis of the Psychopathy Checklist—Revised: Predictive validity of dangerousness. *Clinical Psychology Science and Practice*, 3, 203–215.

- Serin, R. C., & Amos, N. L. (1995). The role of psychopathy in the assessment of dangerousness. International Journal of Law and Psychiatry, 18, 231–238.
- Serin, R. C., Malcolm, P. B., Khanna, A., & Barbaree, H. E. (1994). Psychopathy and deviant sexual arousal in incarcerated sexual offenders. *Journal of Interper*sonal Violence, 9, 3–11.
- Seto, M. C., Khattar, N. A., Lalumière, M. L., & Quinsey, V. L. (1997). Deception and sexual strategy in psychopathy. *Personality and Individual Differences*, 22, 301–307.
- Skeem, J. L., & Cooke, D. J. (2010). Is criminal behavior a central component of psychopathy?: Conceptual directions for resolving the debate. *Psychological As*sessment, 22, 433–445.
- Skeem, J., Johansson, P., Andershed, H., Kerr, M., & Louden, J. (2007). Two subtypes of psychopathic violent offenders that parallel primary and secondary variants. *Journal of Abnormal Psychology*, 116, 395–409.
- Skeem, J. L., & Mulvey, E. P. (2001). Psychopathy and community violence among civil psychiatric patients: Results from the MacArthur Violence Risk Assessment Study. Journal of Consulting and Clinical Psychology, 69, 358–374.
- Skeem, J. L., Polaschek, D. L., Patrick, C. J., & Lilienfeld, S. O. (2011). Psychopathic personality: Bridging the gap between scientific evidence and public policy. *Psychological Science in the Public Interest*, 12, 95–162.
- Skeem, J. L., Poythress, N., Edens, J. F., Lilienfeld, S. O., & Cale, E. M. (2003). Psychopathic personality or personalities?: Exploring potential variants of psychopathy and their implications for risk assessment. Aggression and Violent Behavior, 8, 513–546.
- Smith, P. N., Selwyn, C. N., Wolford-Clevenger, C., & Mandracchia, J. T. (2014). Psychopathic personality traits, suicide ideation, and suicide attempts in male prison inmates. *Criminal Justice and Behavior*, 41, 364–379.
- Smith, S., Edens, J. F., & McDermott, B. E. (2013). Fearless dominance and self-centered impulsivity interact to predict predatory aggression among forensic psychiatric inpatients. *International Journal of Forensic Mental Health*, 12, 33–41.
- Snowden, R. J., & Gray, N. S. (2011). Impulsivity and psychopathy: Associations between the Barrett Impulsivity Scale and the Psychopathy Checklist—Revised. *Psychiatry Research*, 187, 414–417.
- Spidel, A., Hervé, H., Greaves, C., & Yuille, J. C. (2011). "Wasn't me!": A field study of the relationship between deceptive motivations and psychopathic traits in young offenders. *Legal and Criminological Psychol*ogy, 16, 335–347.
- Stanford, M. S., Houston, R. J., & Baldridge, R. M. (2008). Comparison of impulsive and premeditated perpetrators of intimate partner violence. *Behavioral Sciences and the Law*, 26, 709–722.
- Stanford, M. S., Houston, R. J., Mathias, C. W., Vil-

lemarette-Pittman, N. R., Helfritz, L. E., & Conklin, S. M. (2003). Characterizing aggressive behavior. Assessment, 10, 183–190.

- Stevens, G. W., Deuling, J. K., & Armenakis, A. A. (2012). Successful psychopaths: Are they unethical decision-makers and why? *Journal of Business Ethics*, 105, 139–149.
- Swogger, M. T., Conner, K. R., Meldrum, S. C., & Caine, E. D. (2009). Dimensions of psychopathy in relation to suicidal and self-injurious behavior. *Journal of Personality Disorders*, 23, 201–210.
- Swogger, M. T., Walsh, Z., Homaifar, B. Y., Caine, E. D., & Conner, K. R. (2012). Predicting self- and otherdirected violence among discharged psychiatric patients: The roles of anger and psychopathic traits. *Psychological Medicine*, 42, 371–379.
- van Baardewijk, Y., Stegge, H., Bushman, B. J., & Vermeiren, R. (2009). Psychopathic traits, victim distress, and aggression in children. Journal of Child Psychology and Psychiatry, 50, 718–725.
- van Baardewijk, Y., Vermeiren, R., Stegge, H., & Doreleijers, T. (2011). Self-reported psychopathic traits in children: Their stability and concurrent and prospective association with conduct problems and aggression. Journal of Psychopathology and Behavioral Assessment, 33, 236–245.
- Verona, E., Hicks, B. M., & Patrick, C. J. (2005). Psychopathy and suicidality in female offenders: Mediating influences of personality and abuse. *Journal of Consulting and Clinical Psychology*, 73(6), 1065–1073.
- Verona, E., Patrick, C. J., & Joiner, T. E. (2001). Psychopathy, antisocial personality, and suicide risk. *Journal of Abnormal Psychology*, 110, 462–470.
- Veselka, L., Schermer, J., Martin, R. A., & Vernon, P. A. (2010). Relations between humor styles and the Dark Triad traits of personality. *Personality and Individual Differences*, 48, 772–774.
- Vitacco, M. J., Neumann, C. S., & Pardini, D. A. (2014). Predicting future criminal offending in a community-based sample of males using self-reported psychopathy. *Criminal Justice and Behavior*, 41, 345–363.
- Vitacco, M. J., Neumann, C. S., & Wodushek, T. (2008). Differential relationships between the dimensions of psychopathy and intelligence: Replication with adult jail inmates. *Criminal Justice and Behavior*, 35, 48–55.
- Vitaro, F., Gendreau, P. L., Tremblay, R. E., & Oligny, P. (1998). Reactive and proactive aggression differentially predict later conduct problems. *Journal of Child Psychology and Psychiatry*, 39, 377–385.

Walsh, T., & Walsh, Z. (2006). The evidentiary intro-

duction of Psychopathy Checklist—Revised assessed psychopathy in U.S. courts: Extent and appropriateness. *Law and Human Behavior*, 30, 493–507.

- Walsh, Z. (2013). Psychopathy and criminal violence: The moderating effect of ethnicity. *Law and Human Behavior*, 37, 303–311.
- Walsh, Z., & Kosson, D. S. (2008). Psychopathy and violence: The importance of factor level interactions. *Psychological Assessment*, 20, 114–120.
- Walsh, Z., Swogger, M. T., & Kosson, D. S. (2009). Psychopathy and instrumental violence: Facet level relationships. *Journal of Personality Disorders*, 23, 416–424.
- Walters, G. D. (2003). Predicting institutional adjustment and recidivism with the Psychopathy Checklist factor scores: A meta-analysis. *Law and Human Behavior*, 27, 541–558.
- Waschbusch, D., Porter, S., Carrey, N., Kazmi, O., Roach, K., & D'Amico, D. (2004). Investigation of the heterogeneity of disruptive behaviour in elementary-age children. *Canadian Journal of Behavioural Science*, 36, 97–112.
- Waschbusch, D. A., & Willoughby, M. T. (2008). Attention-deficit/hyperactivity disorder and callous– unemotional traits as moderators of conduct problems when examining impairment and aggression in elementary school children. Aggressive Behavior, 34, 139–153.
- Williamson, S. E., Hare, R. D., & Wong, S. (1987). Violence: Criminal psychopaths and their victims. Canadian Journal of Behavioral Science, 19, 454–462.
- Woodworth, M., Agar, A., & Coupland, R. (2013). Characteristics of Canadian youth-perpetrated homicides. Criminal Justice and Behavior, 40, 1009–1026.
- Woodworth, M., Freimuth, T., Hutton, E. L., Carpenter, T., Agar, A. D., & Logan, M. (2013). High-risk sexual offenders: An examination of sexual fantasy, sexual paraphilia, psychopathy, and offence characteristics. *International Journal of Law and Psychiatry*, 36, 144–156.
- Woodworth, M., & Porter, S. (2002). In cold blood: Characteristics of criminal homicides as a function of psychopathy. *Journal of Abnormal Psychology*, 111, 436–445.
- World Health Organization. (2004). International Statistical Classification of Diseases and Health-Related Problems. Geneva: Author.
- Yang, M., Wong, S. P., & Coid, J. (2010). The efficacy of violence prediction: A meta-analytic comparison of nine risk assessment tools. *Psychological Bulletin*, 136, 740–767.

# CHAPTER 26

# Psychopathy and Substance Use Disorders

JARROD M. ELLINGSON ANDREW K. LITTLEFIELD ALVARO VERGÉS KENNETH J. SHER

here has been a long-standing awareness of the co-occurrence of psychopathy and substance use disorders (SUDs). Recent theoretical and factor-analytic work has suggested that a dispositional factor of externalizing proneness, reflecting shared variance among different forms of disinhibitory psychopathology, contributes to both psychopathy and SUDs. Furthermore, facets of psychopathy within differing inventories that relate most closely to disinhibitory psychopathology-namely, those reflecting impulsive nonplanfulness and reckless irresponsibility-have demonstrated particularly strong associations with SUDs. In light of this evidence, externalizing proneness has increasingly been a focus of attempts to elucidate the relationship between psychopathy and SUDs. Research efforts on psychopathy and SUDs have been aided by the development of trait measures of externalizing proneness, particularly the Externalizing Spectrum Inventory (Krueger, Markon, Patrick, Benning, & Kramer, 2007; Patrick, Kramer, Krueger, & Markon, 2013).

The major focus of this chapter is on externalizing proneness in relation to mechanisms for the co-occurrence of psychopathy and SUDs across four broad domains of research—personality dimensions, developmental models, neurobiological mechanisms, and genetic mechanisms. The developmental literature has consistently demonstrated that both psychopathy and SUDs peak during late adolescence or early adulthood and gradually decline thereafter. Regarding the neurobiological mechanisms of externalizing proneness and the co-occurrence of psychopathy and SUDs, dysfunction in the prefrontal cortex and anterior cingulate cortex has been of particular interest, as have been biomarkers such as P3 and error-related negativity. In addition, genetic research has vielded evidence for genes of potential relevance to both constructs, including the MAOA, COMT, ANK1, 5-HTT, and CHRM2 genes. After reviewing relevant findings in these different areas of research, we conclude the chapter with a discussion of the clinical consequences and implications of this cooccurrence.

# Background

The co-occurrence of SUDs and psychopathy has been highlighted in historic writings. For example, in his seminal text *The Mask of Sanity*, Cleckley (1976) noted that "a major point about the psychopath and his relation to alcohol can be found in the shocking, fantastic, uninviting, or relatively inexplicable behavior which emerges when he drinks—sometimes when he drinks only a little" (p. 356). The extant literature on substance use research also shows early recognition of this co-occurrence, as individuals diagnosed as psychopathic largely comprised samples in some of the earliest published investigations of alcoholism (Knight, 1937).

Researchers in the psychopathy and SUDs areas have proposed and tested different models to explain this co-occurrence. Early laboratory research focused on characteristics of psychopathic individuals that may increase liability for engaging in problematic substance use. Hare (1965) postulated that individuals with psychopathy have an underreactive autonomic nervous system, for which they compensate by engaging in behaviors such as transgressive acts (Quay, 1965) or use of intoxicating substances that heighten arousal or alter mood. Consistent with hypoarousal as a mechanism for substance use, some investigators have reported a preference for stimulants among high-psychopathy individuals (e.g., Reid, 1988). Available data on use of particular substances in relation to psychopathy have yielded mixed findings regarding preference for stimulants (e.g., cocaine, amphetamine) relative to other illicit drugs (e.g., cannabis, heroin; consistent with a preference-see Hopley & Brunelle, 2012; inconsistent with a preference—see Smith & Newman, 1990). Furthermore, motives associated with direct positive reinforcement (i.e., enhancement motives) have been found to mediate relations for problematic alcohol use with Cluster B personality disorder symptoms more broadly (Tragesser, Trull, Sher, & Park, 2008) but not with psychopathic traits (Reardon, Lang, & Patrick, 2002). Instead, in an assessment of incarcerated males for psychopathy along with alcohol problems and motives for use, Reardon and colleagues found that motives associated with negative reinforcement (i.e., coping motives) mediate these associations.

Prominent theoretical and empirical work from the 1930s through the 1980s that has sought to identify typologies of alcoholics (i.e., characteristics that distinguish subgroups of individuals exhibiting severe alcohol problems) is of particular relevance to psychopathy, as subtypes were often characterized by the presence–absence of antisocial personality or psychopathic traits (e.g., Babor et al., 1992; Cloninger, 1987; Knight, 1937). Based on his work with clinical populations that largely comprised individuals with psychopathic traits, Knight (1937) proposed two types of alcoholics: (1) essential alcoholics, who exhibit lifelong alcohol-related problems and marked immaturity, and (2) reactive alcoholics, who develop alcoholrelated problems in response to environmental factors later in life. Cloninger (1987) formulated a typological theory of alcoholism based on personality and neurobiological risk factors for alcohol dependence that distinguished two subtypes: (1) Type 1 alcoholics, exhibiting loss of control over drinking and high scores on personality dimensions of harm avoidance and reward dependence, and (2) Type 2 alcoholics, exhibiting frequent fighting and/or arrests and high levels of dispositional novelty seeking. Zucker (1986) proposed multiple forms of alcoholism marked by differing developmental trajectories, including an earlyemerging antisocial subtype. Subsequently, Babor and colleagues (1992) proposed a model similar to Cloninger's, with Type A alcoholics characterized by later onset, fewer childhood risk factors, less severe alcohol dependence, and less psychopathology, and Type B alcoholics characterized by early onset of alcohol use, childhood risk factors, more severe dependence, polysubstance use, and greater psychopathology (including antisocial personality disorder).

Thus, individuals exhibiting alcohol use disorder in conjunction with high psychopathic tendencies have been labeled essential, Type 2, antisocial, or Type B alcoholics. However, empirical investigations have yielded only limited support for these typologies (e.g., Bucholz et al., 1996), and they have generally fallen out of favor among SUD researchers in recent years. Nonetheless, it is clear that considerable heterogeneity exists among those suffering from alcoholism in terms of individual-difference characteristics (including personality dimensions) highlighted in these typological theories. Additionally, other historical writers have distinguished subtypes of alcoholism based on the extent, nature, and ontogeny of comorbid conditions-such as Winokur, Rimmer, and Reich (1971), who distinguished between primary and secondary alcoholism. Within this framework, alcoholism secondary to sociopathy was seen as an important variant and notable for the high density of sociopathy in the pedigrees of these patients.

Theoretical work across disciplines has suggested that a dispositional factor, sometimes labeled "disinhibitory liability" (Vanyukov et al., 2012), entails general deficits in inhibitory control and proclivities toward social deviance (e.g., rule breaking), and confers risk for all externalizing disorders, including psychopathy and SUDs (e.g., Gorenstein & Newman, 1980; Iacono, Carlson, Taylor, Elkins, & McGue, 1999; Sher & Trull, 1994; Yancey, Venables, Hicks, & Patrick, 2013). Although this perspective is not new, it has received increasing attention in light of evidence that overlap among diverse externalizing conditions is best explained by a common higher-order factor (e.g., Krueger, 1999; Krueger et al., 2002). Furthermore, this model is consistent with the alternative trait-dimensional model for personality disorders included in Section III of the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association [APA], 2013), which lists disinhibition as one of five broad personality dimensions underlying personality pathology.

In this chapter we briefly reviews empirical work documenting the co-occurrence of psychopathy and SUDs, then, as the chapter's centerpiece, review models and mechanisms for the co-occurrence of psychopathy and SUDs, with an emphasis on work pertaining to disinhibitory psychopathology across four broad domains of research—personality factors, developmental models, neurobiological mechanisms, and genetic mechanisms. Following this, we conclude with a discussion of the clinical implications of this systematic cooccurrence.

# Evidence of Comorbidity between Psychopathy and SUDs

# Assessment of Psychopathy/SUDs

Both psychopathy and SUDs can be reliably and validly measured through self-report (e.g., Lilienfeld, Widows, & PAR Staff, 2005; World Health Organization [WHO] Assist Working Group, 2002) and interview-based assessments (e.g., Hare, 2003; McLellan, Luborsky, Woody, & O'Brien, 1980). Although the constructs of psychopathy and SUDs overlap to some extent, they have been traditionally measured separately. However, increasing acknowledgment of common liability to psychopathy- and substance use-related behaviors (Beauchaine & McNulty, 2013; Blonigen, Patrick, et al., 2010; Krueger, Caspi, Moffitt, & Silva, 1998; Krueger et al., 2002; Krueger & Markon, 2006a; Vanyukov et al., 2012; Young et al., 2009) has led researchers to develop a comprehensive, integrative model for assessing externalizing psychopathology.

The Externalizing Spectrum Inventory (ESI) is a 415-item self-report measure of externalizing psychopathology, developed for use with clinical and nonclinical samples (Krueger, Markon, et al., 2007). Development of this instrument started with the selection of multiple items targeting 15 specific constructs identified through examination of the literature (including lack of remorse; alcohol, marijuana, and drug use; antisocial behavior; and impulsivity). Systematic refinement of this initial item set through use of item-response modeling and factor analysis, across three waves of data in samples of college students and incarcerated prisoners, led to a final array of 23 unidimensional facet scales organized in a hierarchical model (i.e., bifactor model; Holzinger & Swineford, 1937) that includes a general factor on which all facet scales load, reflecting disinhibition proneness, along with two residual factors encompassing callous-aggressive tendencies and substance abuse. Brief versions of the ESI have since been constructed, including a 100-item version (ESI-100) that produces only an overall score (Hall, Bernat, & Patrick, 2007), a 159-item version that allows estimation of the three factors identified by Krueger, Markon, and colleagues (2007), and a 160-item brief form (ESI-BF) that provides coverage of all 23 lower-order facets and mirrors the higher-order factor structure of the full ESI (Patrick, Kramer, et al., 2013). The ESI-BF is the current recommended alternative to the full-form ESI.

Since its creation, the ESI has been validated in relation to several criterion measures of externalizing psychopathology. Hall and colleagues (2007) reported that higher scores on the 100item version of the ESI, indexing general externalizing psychopathology, are associated with reduced amplitude of the error-related negativity, an event-related potential (ERP) that is thought to reflect self-monitoring following behavioral errors. Nelson, Patrick, and Bernat (2011) extended this finding to the ESI-100 and two variants of the P3 component, which is thought to be a biomarker of externalizing proneness (see "Biomarkers of Inhibitory Control" below). In addition, scores on the general externalizing factor as assessed by the 159-item version of the ESI show significant associations with several external criteria, including interview-assessed symptoms of antisocial personality disorder, conduct disorder, alcohol and drug dependence, and nicotine use disorder, along with questionnaire-assessed personality variables, including low constraint and high negative emotionality (Venables & Patrick, 2012). Furthermore, this study found statistically significant associations for the callous-aggression residual factor with most facets of psychopathy assessed by self-report and interview, as well as with aggressive tendencies, even when researchers adjust for overlap with the general disinhibition factor through semipartial correlations. Similarly, the substance abuse residual factor was associated with alcohol and drug dependence, even after adjustment for the general disinhibition factor. Using factors derived from the ESI-BF, associations have been shown with trait and broad factor scores from the Multidimensional Personality Questionnaire (Tellegen, 1982; Tellegen & Waller, 2008) that closely resemble those for the factors of the full-form ESI, suggesting that it provides a viable and efficient alternative to the full ESI (Patrick, Kramer, et al., 2013).

#### Antisocial Personality Disorder and SUDs

Antisocial personality disorder (ASPD) was introduced as a disorder in DSM-III (APA, 1980). Although it was originally intended to be closely related to psychopathy, ASPD overemphasizes symptoms related to delinquent and criminal behavior and underemphasizes symptoms related to interpersonal and affective deficits (Hare & Neumann, 2008). However, being part of the official DSM classification of disorders, it has been assessed in several large epidemiological studies, which provide rich data on its comorbidity with SUDs.

The Epidemiologic Catchment Area study, which assessed DSM-III disorders, found that 83.6% of participants diagnosed with ASPD had a co-occurring lifetime SUD (Regier et al., 1990). In addition, rates of ASPD among participants diagnosed with lifetime SUDs ranged from 14.3% (alcohol) to 42.7% (cocaine). Whereas DSM-III ASPD was largely diagnosed by antisociality, rule breaking, irresponsibility, and difficulty in developing emotional commitments, subsequent diagnostic revisions (III-R, IV, and now 5) expanded the construct to include a more traditional psychopathic personality trait of "lack of remorse." Similarly, results from the National Comorbidity Survey, which assessed DSM-III-R disorders (APA, 1987), showed that rates of ASPD for individuals diagnosed with lifetime alcohol dependence were 16.9 and 7.8% among males and females, respectively (Kessler et al., 1997).

Findings from another large-scale study that assessed both clinical and personality disorders

as defined in DSM-IV (APA, 1994) also demonstrate significant associations between ASPD and both alcohol (Hasin, Stinson, Ogburn, & Grant, 2007) and drug use disorders (Compton, Thomas, Stinson, & Grant, 2007), even when researchers adjusted for sociodemographic variables and other psychopathology. The prevalence of past-12-month SUDs among National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) participants diagnosed with ASPD ranged from 6.8% (any drug dependence) to 28.7% (any alcohol use disorder), whereas the prevalence of ASPD among those diagnosed with past-12month SUDs ranged from 7.4% (alcohol abuse) to 39.5% (any drug dependence; Grant et al., 2006). In addition, research using the NESARC dataset showed that associations between ASPD and SUDs were stronger in females than in males (Alegria et al., 2013; Compton, Conway, Stinson, Colliver, & Grant, 2005), that the association between ASPD and SUDs remained significant when analyzing the latent factor structure of personality disorders (Trull, Vergés, Wood, Jahng, & Sher, 2012), and that history of lifetime illicit drug use disorders significantly predicted persistent antisocial behavior at 3-year follow-up (Goldstein & Grant, 2009). Furthermore, 3-year follow-up data from the NESARC study were used to examine the association between personality disorders and persistence of SUDs (Fenton et al., 2012; Hasin et al., 2011), producing evidence for a unique relationship between ASPD and SUDs (i.e., when researchers adjusted for all other personality disorders). However, Vergés and colleagues (2014) questioned these findings because personality disorders were assessed at different waves in NESARC and a truly prospective comparison among personality disorders was not possible with this design.

Strong associations between ASPD and SUDs have also been found in specific populations, such as college students (Sylvers, Landfield, & Lilienfeld, 2011) and clinical samples in rural and urban areas (Chávez, Dinsmore, & Hof, 2010; Mueser et al., 2006). Moreover, the co-occurrence of ASPD and SUDs is related to more severe clinical presentations (Goldstein, Dawson, Saha, Ruan, Compton, & Grant, 2007; Mueser et al., 2006, 2012), interference in basic decision-making processes (Mellentin, Skøt, Teasdale, & Habekost, 2013), and poorer treatment outcomes (Brorson, Ajo Arnevik, Rand-Hendriksen, & Duckert, 2013; Compton, Cottler, Jacobs, Ben-Abdallah, & Spitznagel, 2003; Fridell, Hesse, & Johnson, 2006).

#### Psychopathy and SUDs

As described by Neumann, Hare, and Mokros (Chapter 3, this volume), the most frequently used instrument for assessing psychopathy has been the Psychopathy Checklist—Revised (PCL-R; Hare, 2003), an inventory of diagnostic features that is completed on the basis of a semistructured interview, official records, and other collateral information. Although the factor structure of the PCL-R has been a matter of extensive debate, the most common perspective is that its items reflect at least two broad, correlated factors: Factor 1, encompassing affective-interpersonal features of psychopathy (e.g., callous-unemotional traits), and Factor 2, reflecting impulsive-antisocial features (e.g., deviant lifestyle) (Blonigen, Patrick, et al., 2010; Harpur, Ralph, & Hare, 1988). However, a proposed four-factor solution identifies two facets within each broad factor, affective and interpersonal facets within Factor 1, and impulsive lifestyle and antisocial facets within Factor 2 (Hare, 2003; Vitacco, Neumann, & Jackson, 2005; Vitacco, Rogers, Neumann, Harrison, & Vincent, 2005).

#### Adults

A number of studies conducted in prison settings have investigated the association of psychopathy, assessed by the PCL-R, with SUDs. The most consistent finding has been a significant association of total psychopathy scores with SUDs that is entirely explained by the impulsive–antisocial factor (Blackburn & Coid, 1998; Blackburn, Logan, Donnelly, & Renwick, 2003; Hart, Forth, & Hare, 1991; Hemphill, Hart, & Hare, 1994; Reardon et al., 2002; Smith & Newman, 1990). This led Taylor and Lang (2006), in the previous version of this chapter, to conclude that the impulsive–antisocial, but not the affective–interpersonal, domain of psychopathy is associated with higher rates of SUDs.

However, two more recent studies involving inmate samples that examined correlates for the four facets rather than the two broad PCL-R factors suggested a more complex picture (Kennealy, Hicks, & Patrick, 2007; Walsh, Allen, & Kosson, 2007). Consistent with previous research, Walsh and colleagues (2007) found a strong and robust association for PCL-R Factor 2 with substance dependence. However, the impulsive lifestyle facet of Factor 2 demonstrated stronger associations than the antisocial facet with lifetime symptoms of alcohol and illicit drug dependence in this male sample, and with substance use among female offenders in another study (Kennealy et al., 2007). Regarding facets of Factor 1, the interpersonal facet was positively correlated with cocaine, but not other drug, dependence symptoms (Walsh et al., 2007). Furthermore, adjusting for the other PCL-R facets resulted in negative correlations between the affective facet and some (though not all) substance use measures in both studies (Kennealy et al., 2007; Walsh et al., 2007), consistent with negative association of this facet with participation in substance use treatment (Durbeej, Palmstierna, Berman, Kristiansson, & Gumpert, 2014).

Studies using community samples, including studies conducted in the United States (Neumann & Hare, 2008; Vachon, Lynam, Loeber, & Stouthamer-Loeber, 2012), Great Britain (Coid, Yang, Ullrich, Roberts, & Hare, 2009), and Bulgaria (Wilson, Abramowitz, Vasilev, Bozgunov, & Vassileva, 2014), have yielded findings somewhat discrepant from those using inmate samples. In some studies, the four facets of the Psychopathy Checklist: Screening Version (PCL:SV; Hart, Hare, & Cox, 1995) have demonstrated associations with alcohol use (Neumann & Hare, 2008) and smoking quantity (Vachon et al., 2012); however, other studies have demonstrated associations only for certain facets of this inventory. Coid and colleagues (2009) reported associations for the impulsive lifestyle facet only with cannabis use and any drug dependence, whereas the antisocial facet demonstrated associations with these variables and heroin and amphetamine dependence. In another community sample study, Vachon and colleagues (2012) reported an association for the antisocial facet as well with alcohol problems. Regarding facets of Factor 1, the affective facet was associated only with heroin use in the study by Coid and colleagues, whereas the interpersonal facet demonstrated associations with heroin, cocaine, and amphetamine use, as well as drug problems, in the study by Vachon and colleagues (but only among European Americans).

#### Adolescents

Research on the co-occurrence of psychopathy and SUDs among adolescents is comparatively scarce. This lack of investigative work on psychopathy and SUDs among adolescents may change with the inclusion of limited prosocial emotions as a diagnostic specifier for conduct disorder in DSM-5 (APA, 2013), which is intended to capture a psychopathic variant of conduct disorder. However, findings from the limited empirical work on psychopathy and SUDs that has been conducted with adolescents are generally consistent with the adult literature in showing a robust association between these clinical conditions (e.g., Harvey, Stokes, Lord, & Pogge, 1996; Hillege, Das, & de Ruiter, 2010; Mailloux, Forth, & Kroner, 1997; Salekin, Leistico, Neumann, DiCicco, & Duros, 2004; Vahl et al., 2014).

A number of studies have investigated associations of scores on the Psychopathy Checklist: Youth Version (PCL:YV; Forth, Kosson, & Hare, 2003) with substance use in treatment-referred or adjudicated adolescent samples. Significant associations for the impulsive-irresponsible factor of the PCL:YV with drug and alcohol use disorders were reported both in a sample of adolescents referred for substance abuse treatment (Hemphälä & Tengström, 2010) and in a sample of incarcerated adolescent females (Bauer, Whitman, & Kosson, 2011). Furthermore, within a sample of adolescents referred for substance abuse treatment, O'Neill, Lidz, and Heilbrun (2003a) found an association between psychopathy and positive urinalysis during treatment. Similar associations with substance use measures have been shown for another frequently employed measure of psychopathy in adolescents, Andershed, Kerr, Stattin, and Levander's (2002) Youth Psychopathic Traits Inventory (e.g., Colins, Bijttebier, Broekaert, & Andershed, 2013; Hillege et al., 2010; Poythress, Dembo, Wareham, & Greenbaum, 2006; Vahl et al., 2014). In contrast, some studies have reported null associations between psychopathy and substance-related variables, including age of onset of use (Corrado, Vincent, Hart, & Cohen, 2004; O'Neill, Lidz, & Heilbrun, 2003b) and the number of drugs used (O'Neill et al., 2003b).

#### Summary

Most studies to date have found significant associations between psychopathy scores and measures of substance use and SUDs in a wide range of samples, including criminal, community, and clinical samples across development stages (adolescents and adults). Regarding subdimensions of psychopathy, there seems to be a robust association between the impulsive–antisocial factor and substance involvement, but less consistent or null associations for the affective–interpersonal factor. In studies employing the lower-level facets, associations are somewhat less robust, with the impulsive lifestyle and antisocial facets showing larger associations than the affective or interpersonal facets. Notably, differential associations for the factors or facets of psychopathy have also been reported from analyses using partial correlations (i.e., adjusting for the other factors or facets; e.g., Hall, Benning, & Patrick, 2004); however, these results should perhaps be interpreted with caution in view of concerns raised about the interpretation of residualized scores (Lynam, Hoyle, & Newman, 2006).

Although informative, most published studies of this type to date have been cross-sectional, leaving questions regarding the temporal relation between psychopathy and SUDs unresolved. An exception to this is a study by Loney, Taylor, Butler, and Iacono (2007) of male twins assessed initially at ages 16–18, then again 6 years later using a 16-item self-report index of psychopathy, the Minnesota Temperament Inventory (MTI), and a diagnostic interview focusing on clinical problems including SUDs. Results from this study showed that the antisocial factor of the MTI predicted alcohol and nicotine, but not cannabis, dependence at follow-up.

#### **DSM-5** Changes Relevant to Dual Diagnosis

With the introduction of DSM-5 (APA, 2013), three major changes have been made in the diagnosis of SUDs. First, rather than SUDs being represented by two subtypes, abuse and dependence, the subtype distinction has been discarded in favor of a single SUD diagnosis. Whereas in DSM-IV (APA, 1994) endorsement of any one of four abuse symptoms and/or three or more of seven dependence symptoms would qualify an individual as meeting criteria for an SUD diagnosis, in DSM-5 meeting two or more of 11 criteria fulfills criteria for an SUD diagnosis. Second, "craving" has been added as a diagnostic criterion for SUD in DSM-5. Third, and particularly relevant to the degree of comorbidity between psychopathy and SUDs, is the abandonment of recurrent substancerelated legal problems as a diagnostic criterion. Within DSM-IV, recurrent substance-related legal problems (an abuse criterion), by itself, would have qualified someone for an SUD diagnosis; under DSM-5, it has no standing and does not contribute to a diagnosis.

The decision to eliminate the "legal problems" criterion might be conjectured to reduce estimates of comorbidity between psychopathy and SUDs. However, no published work to date has investigated this possibility. To evaluate this possibility for our purposes in this chapter, we compared associations of ASPD (assessed in Wave 1 of NESARC; Grant et al., 2004) with past-year alcohol use disorder in Wave 2 of NESARC (Grant & Kaplan, 2005) when assessed using DSM-IV versus DSM-5 criteria. (Note that craving was assessed only at Wave 2.) The odds ratios were very similar across the two diagnoses (3.2 for DSM-IV alcohol use disorder and 3.1 for DSM-5 alcohol use disorder), suggesting that this diagnostic revision has little practical implication for past-year diagnosis, which is not surprising given the very low past-year prevalence (<1%) of endorsing recurrent alcohol-related problems at Wave 2. However, it is not clear whether removal of the "legal problems" criterion would exert a more substantial effect in samples that are clinically ascertained or ascertained based on involvement in the criminal justice system.

While most studies of SUD-psychopathy comorbidity have examined the association of psychopathy dimensions or diagnosis with syndromal SUD (as do most studies of the externalizing spectrum), it is important to point out that some specific criteria might be more related to psychopathy than others. Although most factor analyses strongly suggest that various SUDs can be represented as a single factor (Hasin et al., 2013), genetic factor analyses (Kendler, Aggen, Prescott, Crabbe, & Neale, 2012) suggest a more complex underlying factor structure and raise the possibility that shared vulnerability to psychopathy and SUDs could have specific components that are not adequately represented by overarching models, as implied by the externalizing spectrum model. It is worth noting that some SUD criteria (e.g., those associated with impaired control and inability to abstain from use) overlap definitionally with notions of disinhibition, while others (e.g., tolerance, withdrawal) are conceptualized as neuroadaptations to repeated substance use. More refined analyses relating specific facets of psychopathy with more specific symptoms of SUDs might reveal important, distinct forms of comorbidity that could be important both etiologically and with respect to identifying novel treatment targets.

## Understanding Comorbidity

#### Personality Factors

An extensive literature has linked various personality traits to particular subtypes of psychopathy (e.g., Benning, Patrick, Blonigen, Hicks, & Iacono, 2005; Benning, Patrick, Hicks, Blonigen, & Krueger, 2003; Harpur, Hare, & Ralph, 1989; Lynam & Derefinko, 2006; Patrick, 1994; Sher & Trull, 1994; Widiger & Lynam, 1998) and SUDs (see Littlefield & Sher, 2016, for a recent review). As noted by Ruiz, Pincus, and Schinka (2008), several researchers have postulated that shared personality traits may contribute to the comorbidity between psychopathy and SUDs (e.g., Krueger, 2002; Krueger, Markon, et al., 2007; Millon & Davis, 1996; Sher & Trull, 1994; Widiger & Trull, 1992).

A meta-analysis by Ruiz and colleagues (2008) summarized relations of five-factor personality traits (broadly conceived) with ASPD, SUDs, and their co-occurrence, and identified low levels of Conscientiousness and Agreeableness and high levels of several impulsivity facets (e.g., excitement seeking, low deliberation) as the "shared personality configuration" (p. 379) across ASPD and SUDs groups. These associations are neither surprising nor specific, considering evidence from other meta-analyses indicating that lower levels of Conscientiousness (and to a lesser degree, Agreeableness) are associated with many internalizing and externalizing disorders (Kotov, Gamez, Schmidt, & Watson, 2010; Malouff, Thorsteinsson, & Schutte, 2005). However, there also appear to be unique personality relations with ASPD/SUD compared to other disorders. For example, these meta-analyses also identified elevated neuroticism as the most robust personality correlate for many disordered behaviors, reflecting Costa and Widiger's (1994) position that "neuroticism is an almost ubiquitously elevated trait within clinical populations" (p. 81). However, findings from Ruiz and colleagues suggested only a relatively small positive relationship between ASPD and neuroticism (presumably reflecting fearlessness and low anxiety; Lilienfeld & Andrews, 1996; Lynam, 2002; see Ruiz et al., 2008; Widiger & Lynam, 1998); furthermore, Kotov and colleagues (2010) found that disinhibition was linked much more clearly to SUDs than to internalizing pathologies (ASPD was not examined in this meta-analysis). Thus, it appears that the relation between psychopathy and SUDs might be partially accounted for by personality deviations common to a range of disorders (in domains of Conscientiousness and Agreeableness), as well as traits more specific to these externalizing conditions (various measures of impulsivity-disinhibition).

Given these observations, it is sensible that the majority of more recent personality models proposed for the psychopathy–SUD relation have focused on measures related to impulsivity (see Sher & Trull, 1994, for a broad review of various models linking personality to ASPD-SUDs). For example, several researchers have suggested that viewing both antisocial and problematic substance use behaviors as indicators of a broad externalizing dimension of psychopathology is a particular useful framework to consider the role of impulsivity-like personality traits in the psychopathy-SUD relation (Krueger, 2002; Krueger et al., 1998; Krueger & Markon, 2006a, 2006b; Krueger, McGue, & Iacono, 2001). More specifically, Krueger and colleagues (2002) demonstrated that reverse-scored constraint (i.e., a broad-based measure of disinhibition assessed via the Multidimensional Personality Questionnaire; Tellegen, 1982; Tellegen & Waller, 2008) loaded on a general, highly heritable externalizing factor that also included measures of substance use and ASPD. This observation led to the conclusion that "personality and psychopathology are linked at an etiological level" (Krueger et al., 2002, p. 421). Consistent with this notion, evidence from the behavioral genetic literature (see "Genetic Mechanisms" section below) suggests that the vast majority of the genetic correlation between alcohol dependence and conduct disorders is accounted for by variance in behavioral undercontrol, a broad-band measure of impulsivity (Slutske et al., 2002).

Follow-up work undertaken in developing the ESI (Krueger, Markon, et al., 2007), described earlier, examined relations among numerous scale indicators of substance use, antisocial behavior, and personality dimensions using several analytic approaches, including hierarchical clustering and bifactor factor modeling. Although results were somewhat complex and nuanced, findings from the hierarchical clustering analyses generally suggested that measures of personality (e.g., excitement seeking, planful control) were more closely associated with characteristics of psychopathy (e.g., lack of honesty and empathy) than substance use, though personality measures labeled Problematic Impulsivity and Rebelliousness were more closely associated with substance use behaviors. These associations are perhaps not surprising given the apparent content of the Problematic Impulsivity scale (example item: "I have made someone angry with me by doing something without thinking") and that "breaking rules" (example item from the Rebelliousness scale: "Having rules hasn't kept me from breaking them") is inherent in obtaining and using illicit drugs or underage use. As mentioned earlier, the ESI bifactor model included an overall externalizing factor, as well as two specific factors: one factor primarily defined by residual variances of scales assessing substance use and problems, and the other (labeled Callous Aggression; Patrick, Kramer, et al., 2013; Venables & Patrick, 2012) defined by residual variances of certain other scales, with the highest loading indicators reflecting lack of empathy and aggression. Notably, the extent to which variance in specific ESI subscales was explained by the overall externalizing factor versus the specific factors varied. For example, 31% of the variance in Excitement Seeking was explained by the overall externalizing factor, whereas an additional 21% was accounted for by the specific factor characterized by Callous Aggression. Conversely, the general externalizing factor explained 83% of the variance in Problematic Impulsivity, which was the highest loading indicator on this factor, though less than 1% of the variance in this personality measure was accounted for by the specific factor reflecting substance use. These findings suggest that measures of personality linked to impulsivity, indicators of psychopathy-ASPD, and SUDs can be successfully mapped onto both general and more specific externalizing traits.

Subsequent work has shown that total scores on the ESI correlate strongly with adult antisocial behavior and SUDs, and modestly (though statistically significant) with biomarkers of "disinhibition proneness," including the P3 brain potential response and error-related negativity (see Patrick, Venables, et al., 2013, for more details). Patrick, Venables, and colleagues (2013) proposed a "construct-network approach" in which psychometric operationalizations of relevant constructs can be used to identify neural substrates of psychopathology (e.g., pathology related to ASPD and SUDs that shares links to impulsigenic Sharma, Kohl, Morgan, & Clark, 2013] personality traits) and to link clinical conditions with neurophysiology. This proposed approach is consistent with aims of the National Institute of Mental Health's Research Domain Criteria (RDoC) initiative (Insel et al., 2010; Sanislow et al., 2010), directed at reconceptualizing clinical problems in terms of biologically oriented constructs that cut across traditional diagnostic categories. Thus, contemporary research has generally taken a "lumping," transdiagnostic (Nolen-Hoeksema & Watkins, 2011) approach to modeling relations among features linked to psychopathy, SUDs, and personality.

Although the approaches we have just reviewed have merit, there are some limitations to consider. At a basic level, demonstrations that a given indicator (e.g., "impulsivity") loads on a given trait (e.g., "externalizing") merely suggest that said indicator correlates with other indicators of said trait (e.g., SUDs). As noted by Tomarken and Waller (2003), multiple factor structures (and relations among manifest and latent variables generally) can show equal fit to a given dataset, suggesting that refined, definitive etiological models based on correlational data will be difficult (if not impossible) to derive. The previously described "lumping" approach also is inconsistent with a contemporaneous methodological movement within the psychological literature toward developing and using more refined, homogeneous measures of constructs (see Smith, McCarthy, & Zapolski, 2009, for an overview). Supported by a detailed rationale, Smith and colleagues (2009) note that the use of broad composite measures "can retard scientific progress and hamper clinicians' efforts to understand and treat dysfunction" (p. 272). As an example, the methods noted earlier potentially mask relations discovered in prior "splitting" approaches that suggest distinct personality profiles among various subtypes of psychopathy (e.g., Benning et al., 2003, 2005; Harpur et al., 1989; Miller, Lynam, Widiger, & Leukefeld, 2001; Patrick, 1994; Widiger & Lynam, 1998) and SUDs (e.g., Babor et al., 1992; Cloninger, 1987; Zucker, 1986).

With these limitations in mind, we agree with Patrick, Venables, and colleagues (2013) that "a strategic blending of experimental and correlational methods" (p. 903) and "assessments focusing on domain-specific aspects of problem tendencies" (p. 913), combined with the approaches reviewed above, can further clarify the link between psychopathy, SUDs, and personality. Furthermore, the potential value of homogeneous measures suggests that greater investigative attention should be devoted to lower-order (e.g., the 23 unidimensional scales of the ESI) than to higher-order scales (e.g., the general, disinhibitory proneness factor of the ESI).

## **Developmental Models**

Prior reviewers (see Lynam & Gudonis, 2005; Sher & Gotham, 1999; Sher, Martinez, & Littlefield, 2011) have discussed in detail factors that are currently considered to contribute to the respective development of psychopathy and SUDs. Interestingly, notable overlap exists between variables thought to contribute to both conditions, with traits broadly related to impulsivity–behavioral undercontrol being most consistently identified as having etiological relevance to these externalizing disorders.

Furthermore, striking similarities are evident in the developmental course of antisocial behaviors associated with psychopathy and SUDs. Although some have highlighted the temporal stability of psychopathy, ASPD, and related personality constructs (e.g., Lynam & Gudonis, 2005), others have noted the sharp decline in antisocial behaviors as individuals transition from adolescence to adulthood (e.g., Blonigen, 2010). This so-called "age-crime curve" (Hirschi & Gottfredson, 1983) parallels the "maturing out" of substance-related pathology (Winick, 1962), which "appears to be primarily a disorder of late adolescence and young adulthood" (Sher & Gotham, 1999, p. 933). Thus, engagement in antisocial behaviors and addictive behaviors both appear to rise and fall during emerging adulthood (roughly ages 18-25; Arnett, 2000).

Perhaps more interesting, it appears that changes in risk factors contributing to both antisocial behaviors and SUDs, such as personality, may contribute to variability in the developmental course of externalizing behaviors. Specifically, Blonigen (2010) proposed that changes in disinhibition and other personality traits underlie changes in antisocial behaviors during emerging adulthood. Providing empirical support for this notion, Blonigen, Littlefield, and colleagues (2010) demonstrated that, relative to individuals who persisted in antisocial behaviors, those who desisted from antisocial behaviors across ages 18-25 showed marked decreases in novelty seeking (a trait broadly related to impulsivity-behavioral undercontrol) and larger increases in reward dependence (a construct related to positive emotionality and negatively related to disinhibition). Similarly, Littlefield, Sher, and Wood (2009) showed (within the same dataset) a relationship for changes in Impulsivity (generally reflecting a lack of planning) and Neuroticism with changes in alcohol-related problems from ages 18 to 35, such that individuals who exhibited the steepest declines in Impulsivity and Neuroticism also displayed the largest reductions in alcohol-related problems. Taken together, these findings suggest a dynamic relationship between personality (particularly measures linked to impulsivity) and behaviors related to psychopathy and SUDs; that is, changes in impulsigenic traits may contribute to developmental changes in longitudinal comorbidity between psychopathy (including antisocial behaviors) and SUDs, though, to our knowledge, an empirical examination of this possibility has yet to be conducted.

#### Neurobiological Mechanisms

Psychopathy and SUDs have been linked to two primary neural regions, consisting of cortical structures such as the prefrontal cortex, and subcortical substrates including the amygdala and striatum. Whereas cortical brain systems are thought to implement cognitive processes, subcortical systems are thought to implement affective-motivational processes. Psychopathy researchers have described a two-process theory of these distinct substrates as they relate to psychopathy (Patrick & Bernat, 2009), with deviations in subcortical function, in particular amygdalar hyporeactivity, underlying callous-unemotional features, and deviations in cortical function underlying impulsive-antisocial features. Similarly, substance use researchers have adopted dual-process models outlining the involvement of these regions in problematic use (Stacy & Wiers, 2010), with subcortical substrates, in particular the mesolimbic reward system, subserving urges to use, and cortical substrates subserving the ability to inhibit those urges (Karoly, Harlaar, & Hutchison, 2013). Thus, these models suggest substantial functional overlap for cortical systems underlying psychopathy and SUD (i.e., impulsivity, disinhibition), but distinct roles for subcortical systems.

## Prefrontal Cortex and Executive Functioning

Reduced volume in the prefrontal cortex (PFC) has been linked with psychopathy (see Koenigs, Kruepke, & Newman, 2010, for a review; see also Raine, Lencz, Bihrle, LaCasse, & Colletti, 2000), and dysfunction in the PFC has been linked to difficulty in modulating urges to engage in addictive behavior (see Baler & Volkow, 2006, for a review). The PFC is posited to implement executive functioning and "forms the apex of a complex neural network that mediates the executive control of behavior, cognition, and emotion" (Halperin & Schulz, 2006, p. 565), thereby influencing a wide range of psychological processes. Initial factoranalytic work suggested that three distinct (albeit correlated) factors accounted for the variability in cognitive control ("executive") tasks involving mental-set shifting, working memory updating, and inhibitory control (Miyake et al., 2000); however, more recent work suggests the presence of a general factor on which tasks of all three types load, along with two residual factors reflecting variance specific to mental-set-shifting tasks and memory-updating tasks (Miyake & Friedman, 2012).

Of the three factors thought to underlie executive functioning, inhibitory control has received the most interest and support in regard to psychopathy (Kiehl, Smith, Hare, & Liddle, 2000) and SUDs (McNamee et al., 2008), with few studies investigating mental-set shifting or working memory updating in relation to these constructs (e.g., Ellingson, Fleming, Vergés, Bartholow, & Sher, 2014). Patrick, Durbin, and Moser (2012) used the term inhibitory control for individual differences in decision making and behavioral inhibition subsuming various concepts in the literature including response inhibition, effortful control (Kochanska, Murray, & Harlan, 2000), neurobehavioral disinhibition (McNamee et al., 2008; Tarter, Kirisci, Habeych, Reynolds, & Vanyukov, 2004), disinhibitory psychopathology (Gorenstein & Newman, 1980; Patrick, Fowles, & Krueger, 2009; Sher & Trull, 1994), and externalizing psychopathology (Achenbach & Edelbrock, 1978; Krueger et al., 2002).

Two brain regions related to inhibitory control have been the primary focus of psychopathy and SUD research on self-regulation and inhibition (see Heatherton, 2011, for a review of the neuroscience of self-regulation), the ventromedial PFC (vmPFC) and the anterior cingulate cortex (ACC). The vmPFC, sometimes grouped with the orbitofrontal cortex (OFC) and labeled the orbitomedial PFC (Heatherton, 2011; Patrick et al., 2012), is thought to guide decision making through consideration of stimulus valence (Arnsten, 2009; Grabenhorst & Rolls, 2011). This region was originally implicated in impulsive-disinhibitory tendencies based on the case of Phineas Gage, who began to exhibit psychopathic-like behavior and excessive consumption of alcohol following a construction accident that essentially eradicated his vmPFC. Drawing on the details of this and other cases of brain injury, Damasio (1994) proposed the "somatic marker hypothesis," which suggests that the vmPFC links a stimulus to potential reward or punishment outcomes and, based on that information, decides on an optimal course of action (e.g., whether to approach or avoid the stimulus). Working from this influential perspective, many investigations of this region's involvement in psychopathy and SUDs have often utilized decisionmaking tasks that include an emotional cueing component. For example, research with high-psychopathy criminal samples has shown deficits on the Ultimatum Game akin to those for patients with vmPFC lesions (Koenigs et al., 2010), and work with treatment-seeking SUD samples has shown parallel deficits on the Iowa Gambling Task (Bechara & Damasio, 2002). Further support for the involvement of the vmPFC in psychopathy and SUDs comes from brain imaging studies, which have identified dysfunction in the vmPFC among criminal psychopaths (Motzkin, Newman, Kiehl, & Koenigs, 2011) and substance-dependent individuals (Volkow & Fowler, 2000), as well as reduced gray-matter volume in criminal psychopaths (Yang, Raine, Colletti, Toga, & Narr, 2010).

The ACC, which is adjacent to but anatomically distinct from the PFC, is thought to implement effortful, top-down control pertinent to goal-directed behavior by signaling the PFC (Bush, Luu, & Posner, 2000; Posner & Raichle, 1994), though some consider the ACC part of the PFC (e.g., Heatherton, 2011). The ACC has been implicated in error monitoring (Carter et al., 1998) and the invocation of additional cognitive control resources following erroneous responses (Kerns, 2006; Kerns et al., 2004). Furthermore, important distinctions have been made between the cognitive, dorsal portion of the ACC, which is activated during response inhibition but not error processing (Menon, Adleman, White, Glover, & Reiss, 2001), and the affective, rostral-ventral portion of the ACC, which modulates activity in the limbic system following an erroneous response (Etkin, Egner, Peraza, Kandel, & Hirsch, 2006; see Bush et al., 2000). Among individuals with SUDs, the ACC has been shown to be hyperactive during cue-elicited craving for cocaine (Childress et al., 1999), alcohol (Heinz et al., 2004), and amphetamine (Yin et al., 2012; see also Cope et al., 2014), possibly indicating attempts to recruit cognitive resources in response to craving. Furthermore, activation of this region predicts subsequent relapse in abstinent alcoholics (Grüsser et al., 2004) and is associated with risky drinking (Claus & Hutchison, 2012), which may indicate its involvement in assessing risk and reward (Karoly et al., 2013). Unexpectedly, however, similar cues among criminal psychopaths with a lifetime diagnosis of illicit drug dependence (methamphetamine, heroin, or cocaine) are associated with less activation in the ACC, which may be due to an absence of internal "cognitive conflict" (Cope et al., 2014). Therefore, additional research is needed to better understand commonalities and distinctions in the function of the ACC in psychopathy as compared to SUDs.

### Biomarkers of Inhibitory Control

Perhaps the most widely studied biomarker of inhibitory control has been the P3, a positive ERP that occurs approximately 300 milliseconds after a stimulus has been presented, typically during an infrequent-target-frequent-nontarget ("oddball") response task (Johnson & Donchin, 1978; Sutton, Braren, Zubin, & John, 1965). The P3 is thought to index neural inhibition and has been suggested to reflect some combination of task difficulty and cognitive resources engaged during the task (see Polich, 2007, for a review). Seminal work on the P3 found reduced amplitude in abstinent alcoholics, relative to healthy, age- and educationmatched controls (Porjesz, Begleiter, & Garozzo, 1980). Associations with P3 have since been demonstrated for a family history of alcoholism (Begleiter, Porjesz, Bihari, & Kissin, 1984), psychopathy (Kiehl, Bates, Laurens, Hare, & Liddle, 2006; Kiehl, Hare, Liddle, & McDonald, 1999; Kiehl et al., 2000), antisocial behavior (Bauer & Hesselbrock, 2003), and liability for externalizing psychopathology (Hicks et al., 2007; Krueger, Skodol, Livesley, Shrout, & Huang, 2007; Patrick et al., 2006; see Patrick, Venables, et al., 2013, for a review).

Of particular interest regarding the co-occurrence of psychopathy and SUDs, Patrick and colleagues (2006) demonstrated that general externalizing proneness fully accounts for relations of individual impulse disorders (i.e., conduct disorder, adult ASPD, alcohol dependence, other drug dependence) with reduced P3 amplitude in a sample of young males from the community. Furthermore, Venables and Patrick (2014), using a sample of incarcerated males, found associations for P300 with impulsive and antisocial features of psychopathy but not callous-unemotional features, suggesting that impulsive-antisocial features of psychopathy may be more reflective of cortical dysfunction. However, it should be noted that much of the work involving P3 and externalizing psychopathology has been conducted with male samples (for exceptions, see Nelson et al., 2011; Patrick, Venables, et al., 2013), pointing to a need for more studies including females to establish the generalizability of reported effects.

Another ERP response that has garnered interest among psychopathy and SUD researchers is the error-related negativity (ERN), an ERP that follows erroneous responses in a performance task. As with the P3, the ERN is typically measured within a laboratory task procedure, such as a congruent-incongruent ("flanker") discrimination task (Carter et al., 1998). The ERN has been posited to reflect conflict monitoring or error detection (Carter et al., 1998) and is thought to be generated by the ACC (Miltner, Braun, & Coles, 1997). Considerably less work has investigated the involvement of the ERN with psychopathy and SUDs; however, reduced ERN amplitude has been reported for a wide range of disinhibition-related variables, including high trait impulsivity (Pailing, Segalowitz, Dywan, & Davies, 2002), general externalizing proneness (Hall et al., 2007), low conscientiousness (Pailing & Segalowitz, 2004), and low socialization (Dikman & Allen, 2000; Pailing & Segalowitz, 2004).

#### Genetic Mechanisms

#### **Behavior Genetic Studies**

Additive genetic influences have been shown to account for a significant proportion of variation in overall psychopathy scores (63%; Larsson, Andershed, & Lichtenstein, 2006; Viding, Frick, & Plomin, 2007), and to a lesser extent childhood precursors, such as conduct disorder (43%; Slutske et al., 1997; Tuvblad, Zheng, Raine, & Baker, 2009). Similarly, additive genetic factors account for a statistically significant proportion of variation in SUDs (55%; Agrawal & Lynskey, 2006; Heath et al., 1997; True et al., 1999; Tsuang et al., 1996; van den Bree, Johnson, Neale, & Pickens, 1998) but again less to SUD precursors, such as substance use initiation (37%; Koopmans, Slutske, Heath, Neale, & Boomsma, 1999; Rhee et al., 2003; Rose, Dick, Viken, & Kaprio, 2001). Furthermore, the P3 brain response, an indicator of liability for general externalizing psychopathology as described earlier, is also appreciably heritable (45-55%; Weinberg, Venables, Proudfit, & Patrick, 2015).

As a follow-up to studies examining the heritabilities of these individual variables, multivariate behavior genetic studies have estimated the etiological basis of their interrelations. For example, using the Dimensional Assessment of Personality Pathology—Differential Questionnaire, Jang, Vernon, and Livesley (2000) reported evidence for significant genetic correlations between substance misuse and traits associated with impulsive–antisocial features of psychopathy, including impulsivity ( $r_{\rm G}$  = .45), recklessness ( $r_{\rm G}$  = .45), and interpersonal hostility ( $r_{\rm G}$  = .41). Significant correlations of lesser magnitude were evident for traits associated with callous-unemotional features of psychopathy, including exploitation ( $r_{\rm G}$  = .19) and remorselessness ( $r_{\rm G}$  = .31). Furthermore, significant genetic overlap has been demonstrated between antisocial behavior disorders and SUDs (Krueger et al., 2002), as well as impulsive-antisocial features of psychopathy and externalizing conditions (Blonigen, Hicks, Krueger, Patrick, & Iacono, 2005). Notably, approximately 80% of the variance in the general externalizing factor reflecting the shared variance across differing externalizing disorders appears to be attributable to genetic factors (Krueger et al., 2002; Young, Stallings, Corley, Krauter, & Hewitt, 2000), and the genetic component of general externalizing proneness accounts for a moderate proportion of variation in SUDs (alcohol dependence = 41%, illicit drug dependence = 32%) and disorders related to psychopathy (conduct disorder = 27%, adult antisocial behavior = 49%). Similarly, approximately 80% of the covariance between P300 amplitude and externalizing psychopathology in males appears to reflect additive genetic influences, suggesting that genes mediate this relationship (Hicks et al., 2007). Finally, a broad-band measure of impulsivity, behavioral undercontrol, was shown by Slutske and colleagues (2002) to account for most of the genetic correlation between alcohol dependence and conduct disorders. However, as of yet, there have been no direct empirical investigations of genetic associations among control, problematic substance use, and psychopathy.

#### Molecular Genetic Studies

Molecular genetic research is important for identifying specific genetic markers that underlie latent genetic factors revealed by behavior genetic research (see Waldman, Rhee, LoParo, & Park, Chapter 14, this volume). In general, the psychiatric genetic literature contains numerous studies reporting significant associations for genetic markers with psychological constructs that have failed to replicate in subsequent work (Maher, 2008; Munafò & Flint, 2011), and this has been a particular concern for candidate gene studies (Duncan, Pollastri, & Smoller, 2014). Thus, the current review is restricted to genetic markers for which replicated associations have been reported for both psychopathy and SUDs, or for indicators of externalizing psychopathology. For a more extensive review of molecular genetic research on externalizing psychopathology, see Gizer, Otto, and Ellingson (2016).

The cognitive processes described earlier, implemented by the prefrontal cortex (and related to externalizing psychopathology), are thought to rely on the functioning of the monoamine neurotransmitters dopamine (DA), serotonin (5-HT), and norepinephrine (Beauchaine, Neuhaus, Zalewski, Crowell, & Potapova, 2011). Therefore, genes that encode for the regulation of these neurotransmitters have been primary targets in molecular genetic studies of externalizing psychopathology, including psychopathy and SUDs.

The monoamine oxidase A (MAOA) gene, located on the X chromosome, encodes for the monoamine oxidase A enzyme, which operates as it breaks down to regulate the amount of neurotransmitter available for neurotransmission. Empirical work on the MAOA gene has typically focused on a functional 30-base-pair variable number of tandem repeats (VNTR; a location in the genome where the short sequence repeats itself), consisting of two to five copies of MAOA repeat alleles. Based on the functional differences across repeats, the MAOA gene is classified as resulting in low activity (two to three repeats) or high activity (four to five repeats) of the monoamine oxidase A enzyme, and high activity has been posited to increase risk for externalizing psychopathology (Sabol, Hu, & Hamer, 1998). However, candidate gene studies focusing on the MAOA gene and psychopathy have yielded inconsistent findings; some have reported increased risk in the initially hypothesized direction (Manuck, Flory, Ferrell, Mann, & Muldoon, 2000), but others have indicated that the low-activity allele confers risk for psychopathy (Beaver et al., 2013; Fowler et al., 2009) or that the low-activity allele only confers risk via interaction effects with environmental risk factors (e.g., child maltreatment; Caspi et al., 2002). Elsewhere, the low-activity MAOA allele has been shown to interact with PCL-R scores to predict violent reconvictions within a criminal sample (e.g., PCL-R scores on violent reconvictions; Tikkanen et al., 2011).

Beaver and colleagues (2013) attributed these discrepant findings to the inappropriate grouping of individuals with two- and three-repeat alleles, citing recent work indicating that significant differences in activity occur only among individuals with two repeats, relative to all other polymorphisms. For SUDs, candidate gene studies have shown significant effects for a three-repeat MAOA allele on individual SUD diagnoses

(Contini, Marques, Garcia, Hutz, & Bau, 2006; Parsian, Cloninger, Sinha, & Zhang, 2003; Saito et al., 2002; Vanyukov et al., 2004), earlier onset of alcohol dependence (Contini et al., 2006), and polysubstance abuse (Contini et al., 2006); however, other studies have failed to replicate these reported associations (Chien, Lin, Chang, & Lung, 2010; Koller, Bondy, Preuss, Bottlender, & Soyka, 2003; Lu, Lin, Lee, Ko, & Shih, 2003). Notably, methylation of the MAOA gene has also been observed among women exhibiting nicotine or alcohol dependence (Philibert, Gunter, Beach, Brody, & Madan, 2008), suggesting that the expression of this gene may be influenced by substance abuse; however, Philibert and colleagues (2008) were unable to measure expression of the MAOA gene reliably. Therefore, further research is needed to investigate the potential impact of substance abuse on MAOA activity.

The catechol-O-methyltransferase (COMT) gene has also received substantial attention in relation to externalizing psychopathology. The COMT gene, located on chromosome 22, encodes for the catechol-O-methyltransferase enzyme, which breaks down dopamine and norepinephrine and is highly expressed in frontal cortical regions. A functional single-nucleotide polymorphism within the COMT gene results in a threeto fourfold difference in activity of the catechol-O-methyltransferase enzyme (rs4680; Lotta et al., 1995), and has been associated with both P3 amplitude (Gallinat et al., 2003; Tsai et al., 2003) and cognitive functioning (Heinz & Smolka, 2006; Schellekens et al., 2012), making it a central focus of psychiatric genetic research. Regarding psychopathy, candidate gene studies have yielded significant effects in relation to psychopathic traits in youth (Fowler et al., 2009) and related clinical phenotypes such as conduct disorder (Monuteaux, Biederman, Doyle, Mick, & Faraone, 2009), antisocial behavior (Vassos, Collier, & Fazel, 2014), and violent offending (Vevera et al., 2009). Studies of SUDs have yielded more mixed results, with one review suggesting significant associations for methamphetamine abuse (Bousman, Glatt, Everall, & Tsuang, 2009), and another reporting significant effects for nicotine dependence but null effects for other drugs (Tammimäki & Männistö, 2010). Tammimäki and Männistö (2010) concluded that the COMT gene likely confers risk for SUDs, although its effects appear to be small.

Three genes encoding for functioning of specific neurotransmitters have also been associated with psychopathy and SUDs. First, the TaqI restriction site in the ANNK1 gene on chromosome 11 is of interest because of its influence on the expression of dopamine receptor 2 (Laakso et al., 2005). This marker has been associated with P3 amplitude in children of alcoholics (Antolin et al., 2009; Hill, Zezza, Wipprecht, Xu, & Neiswanger, 1999), as well as developmental trajectories of P3 (Berman et al., 2006). The TaqI restriction site has also been associated with psychopathic personality traits in a nationally representative sample (Wu & Barnes, 2013) and a treatment-seeking sample with alcohol use disorder (Ponce et al., 2008). Furthermore, robust associations for the TaqI restriction site have been demonstrated with SUDs (Gorwood et al., 2012; Le Foll, Gallo, Le Strat, Lu, & Gorwood, 2009; Munafò & Flint, 2009; Wang, Simen, Arias, Lu, & Zhang, 2013).

Second, the serotonin transporter gene (5-HTT), located on chromosome 17, contains two polymorphisms that encode for serotonin reuptake and availability, a short (s) and a long (l) allele. The l allele, which results in greater serotonin reuptake and less availability in the synaptic cleft, has been associated with impulsivity and aggression (Dick et al., 2013). Candidate gene studies of psychopathy have reported mixed findings, however, with some attributing increased risk to the s allele (Fowler et al., 2009; Sadeh et al., 2010) and others to the l allele (Glenn, 2011). Further, meta-analytic work has implicated the s allele as increasing risk for alcohol dependence (McHugh, Hofmann, Asnaani, Sawyer, & Otto, 2010). Given these conflicting findings, further research is needed to elucidate the role of the 5-HTT gene in psychopathy and SUDs, and to investigate interactions or epigenetic effects involved in its expression (Beach et al., 2013; Nikolas, Friderici, Waldman, Jernigan, & Nigg, 2010).

Finally, the muscarinic acetylcholine receptor M2 (CHRM2) gene, located on chromosome 7, is of interest in regard to externalizing psychopathology. Early linkage studies suggested an association for the region in chromosome 7 that includes CHRM2 with alcohol use disorder (Foroud et al., 2000; Reich et al., 1998), and with reduced P3 amplitude (Jones et al., 2004; Wright et al., 2008). However, more recent work by Danielle Dick and colleagues (2007), using data from the Collaborative Study on the Genetics of Alcoholism (COGA), suggests that associations with alcohol dependence are entirely driven by a subsample of participants with comorbid drug dependenceimplying a relationship with general substance use or externalizing proneness, rather than alcohol use disorder per se. Consistent with this, a follow-up study using COGA project data found associations between CHRM2 and a principal component score aggregate of diagnostic and personality indicators of externalizing psychopathology (Dick et al., 2008). Notably, in both of these COGA studies, statistically significant associations were found for a single-nucleotide polymorphism in intron 4 of CHRM2 (rs1824024), for which statistically significant associations have also been found for reduced P3 amplitude, even after accounting for familial risk for alcohol dependence (Hill et al., 2013).

# **Clinical Implications**

#### **Clinical Consequences of Comorbidity**

Individuals presenting with a SUD and comorbid diagnoses tend to receive more care but have worse treatment outcomes than those with only one diagnosis (Burns, Teesson, & O'Neill, 2005; Cacciola, Alterman, Rutherford, McKay, & Mulvaney, 2001). Furthermore, empirical investigations on the effects of psychopathy on SUD treatment have reported that this comorbidity is associated with longer durations of treatment in order for improvement to occur (Richards, Casey, & Lucente, 2003), poorer treatment engagement (Pankow & Knight, 2012), decreased treatment completion (Alterman, Rutherford, Cacciola, McKay, & Boardman, 1998), positive urinalysis indicating relapse (Alterman et al., 1998; O'Neill et al., 2003a), and fewer treatment gains (Richards et al., 2003). In addition, higher relapse rates have been associated with elevations on personality indices of psychopathy (e.g., Pettinati, Sugerman, & Maurer, 1982).

Empirical work has also demonstrated worse outcomes for criminal offenders with SUDs. Among individuals seeking substance abuse treatment, higher recidivism rates have been associated with psychopathy in both adolescents (O'Neill et al., 2003a) and adults (Richards et al., 2003). Similarly, among high-psychopathy offenders, those with comorbid substance abuse show increased aggression during hospitalization (Hart et al., 1995) and increased recidivism after release (Firestone et al., 1999; Walsh, 1999). Among parolees, greater levels of substance use are associated with increased levels of violent offending (Sacks et al., 2009). Thus, individuals presenting with comorbid psychopathy (or violent tendencies known to be associated with criminal psychopathy) and SUDs pose notable challenges for clinical settings.

Treatment difficulties may stem from at least two characteristics of this population. First, as two distinct psychiatric conditions, the presence of psychopathy and substance abuse may result in worse treatment outcomes because their co-occurrence results in a more complex clinical case. Consequently, treatment of either disorder alone may be insufficient, but concurrently treating both disorders may pose additional challenges. Second, as discussed throughout this chapter, psychopathy and SUDs appear to be the result of common, underlying externalizing psychopathology, and their co-occurrence may signify a very high level on the externalizing continuum. Consequently, their clinical presentation may be particularly difficult to treat because of a greater severity of underlying disinhibitory liability, relative to those with only psychopathy or an SUD. Therefore, individuals presenting with both psychopathy and SUDs may have generally worse treatment outcomes because of both the complexity and severity of their clinical presentation.

#### Clinical Management of Comorbidity

There are at least three possible sources underlying the co-occurrence of psychopathy and SUDs that may be helpful to consider in the treatment of these disorders. First, SUDs may increase liability for psychopathy. For example, cannabis use in adolescence and emerging adulthood has been shown to reflect a genetic and environmental propensity to seek out deviant peers (Gillespie, Neale, Jacobson, & Kendler, 2009). Reciprocally, psychopathy may increase the presence of environmental risk factors for SUDs, such as substance-abusing peers, but empirical work has not investigated this possibility to date. The importance of common environmental factors for SUDs and psychopathy is consistent with the efficacy of intensive interventions for adolescents in the juvenile court system. For example, multisystemic therapy (MST) relies on the therapeutic participation of individuals from the adolescent's social milieu (e.g., home, school, neighborhood) and is an empirically supported treatment for reducing criminal activity (Borduin, Schaeffer, & Heiblum, 2009) and SUD treatment dropout (Henggeler et al., 2006). Similar therapies have not been used with adults, and implementing an intervention that cuts across social milieux in adults would likely pose several challenges. For example, adolescents typically have a legal guardian to monitor them and ensure adherence to the intervention, but adults do not typically have a similar figure in their lives, making resistance to treatment a potential concern. However, the involvement of multiple peers (e.g., relatives, coworkers) in an individual's treatment, and across several social contexts, may be valuable for decreasing recidivism and relapse, as has been demonstrated for MST in adolescents.

In contrast, psychopathic tendencies may in some cases be "substance-induced" (e.g., dependence may lead to criminal activity, disregard for others), but this has not been empirically demonstrated. However, the occurrence of substanceinduced psychopathy would be consistent with empirical work demonstrating effects of protracted, heavy alcohol use on impulsive decision making. For example, one neuroimaging study that compared abstinent alcoholics and controls on a delay-discounting task found group differences in neural activity within frontal regions that appeared consistent with alcohol-induced impairment (Boettiger et al., 2007). Claus, Kiehl, and Hutchison (2011) extended this work by examining brain response in relation to continuous measures of alcohol intake and found that more severe alcohol use was associated with increased delay discounting, as well as greater activity in frontal brain regions during task performance. The authors interpreted these results as indicating that greater cognitive control may have been required for individuals with heavy alcohol use to perform the delay-discounting task. One implication is that protracted substance use may result in cognitive deficits akin to those associated with disinhibitory liability, which would increase liability for psychopathy and potentially contribute to poorer treatment outcomes. Another is that deficits in functioning of frontal regions may be a potential target for treatment. For example, incorporation of cognitive rehabilitation strategies found to be effective in the treatment of alcohol use disorders (Bates, Buckman, & Nguyen, 2013) may constitute a promising intervention for individuals who exhibit such deficits.

Comorbidity may also be the consequence of common underlying influences for both conditions. As highlighted throughout this chapter, the co-occurrence of psychopathy and SUDs appears to be substantially attributable to general externalizing proneness, or disinhibition, which may manifest as impulsive decision making. Specifically, high externalizing proneness may increase one's tendency to prioritize proximal stimuli, such as engaging in a behavior considered exhilarating or rewarding (e.g., criminal activity, substance use), over its distal consequences (e.g., criminal conviction, family or occupational obligations). Therefore, treatments that address deviations in delay discounting, such as those rooted in behavioral economics (e.g., contingency management; Stitzer & Petry, 2006), may address common liability for psychopathy and SUDs. Although there are currently no empirically supported treatments that target cognitive dysfunction common to psychopathy and SUDs, empirical work has demonstrated the efficacy of cognitive training (e.g., working memory training; Bickel, Yi, Landes, Hill, & Baxter, 2011) for remediating cognitive deficits. Furthermore, mindfulness-based therapies are gaining support for preventing relapse in SUDs (e.g., Witkiewitz, Marlatt, & Walker, 2005), perhaps because they increase the individual's awareness of distal consequences and/or decrease the expression of impulsive traits (e.g., acting without thinking). Similarly, approaches of these types could prove effective for reducing problematic behavior in individuals with psychopathy (e.g., criminal activity).

As noted by Taylor and Lang (2006, p. 506) in the version of this chapter in the previous edition, an overarching treatment challenge for this population includes the tendency for individuals high in psychopathy to "regard themselves as invincible and [be] relatively impervious to contrary evidence," leading to a low level of voluntary treatment seeking by this population; that is, individuals with psychopathy are unlikely to seek treatment for psychopathy, and voluntary treatment tends to be for comorbid conditions, such as SUDs. In such cases, motivational interviewing may be beneficial. Motivational interviewing emphasizes the individual's choice and manages resistance by emphasizing how the client may benefit from avoiding problematic behaviors (e.g., substance use, criminal behavior; Miller & Rollnick, 2002). Furthermore, some writers have highlighted the importance of using motivational interventions to target dispositional tendencies, such as high negative emotionality (Gudonis, Derefinko, & Giancola, 2009)

## Conclusions

The increased prevalence of SUDs among individuals with psychopathy has long been recognized by researchers in the substance use and psychopathy areas. Based on theoretical and factor-analytic work highlighting the importance of general dis-

inhibitory liability (e.g., Gorenstein & Newman, 1980; Krueger et al., 2002; Sher & Trull, 1994), as well as the particularly strong association of SUDs with the impulsive-antisocial factor of psychopathy (Coid et al., 2009; Kennealy et al., 2007; Walsh et al., 2007), liability for disinhibitory psychopathology has received increasing attention in relation to the co-occurrence of psychopathy and SUDs. For example, converging evidence suggests that both are associated with common neural systems (e.g., PFC, ACC), biomarkers (e.g., P300, ERN), and genetic markers (e.g., MAOA, COMT, ANNK1, 5-HTT, CHMR2). Future efforts to elucidate the relationship between psychopathy and SUDs will continue to benefit from incorporating measures such as the ESI that index general disinhibitory liability, along with different phenotypic expressions of this liability. Given increasing recognition in the field of the importance of homogeneous measures over more heterogeneous measures (e.g., Smith et al., 2009), the lower-order facet scales of the ESI may prove valuable for understanding better the co-occurrence of these conditions, as well as clarifying mechanisms that contribute to their distinctiveness.

#### ACKNOWLEDGMENTS

This work was supported by National Institutes of Health Grant Nos. F31AA022294 (to Jarrod M. Ellingson) and K05AA017242 (to Kenneth J. Sher).

#### REFERENCES

- Achenbach, T. M., & Edelbrock, C. S. (1978). The classification of child psychopathology: A review and analysis of empirical efforts. *Psychological Bulletin*, 85(6), 1275–1301.
- Agrawal, A., & Lynskey, M. T. (2006). The genetic epidemiology of cannabis use, abuse and dependence. *Addiction*, 101(6), 801–812.
- Alegria, A. A., Blanco, C., Petry, N. M., Skodol, A. E., Liu, S.-M., Grant, B., et al. (2013). Sex differences in antisocial personality disorder: Results from the National Epidemiological Survey on Alcohol and Related Conditions. *Personality Disorders*, 4(3), 214–222.
- Alterman, A. I., Rutherford, M. J., Cacciola, J. S., McKay, J. R., & Boardman, C. R. (1998). Prediction of 7 months methadone maintenance treatment response by four measures of antisociality. *Drug and Alcohol Dependence*, 49(3), 217–223.
- American Psychiatric Association. (1980). Diagnostic and statistical manual of mental disorders (3rd ed.). Washington, DC: Author.

- American Psychiatric Association. (1987). Diagnostic and statistical manual of mental disorders (3rd ed., rev.). Washington, DC: Author.
- American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: Author.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: Author.
- Andershed, H. A., Kerr, M., Stattin, H., & Levander, S. (2002). Psychopathic traits in non-referred youths: A new assessment tool. In E. Blaauw & L. Sheridan (Eds.), Psychopaths: Current international perspectives (pp. 131–158). The Hague: Elsevier.
- Antolin, T., Berman, S. M., Conner, B. T., Ozkaragoz, T. Z., Sheen, C. L., Ritchie, T. L., et al. (2009). D2 dopamine receptor (DRD2) gene, P300, and personality in children of alcoholics. *Psychiatry Research*, 166(2–3), 91–101.
- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. American Psychologist, 55(5), 469–480.
- Arnsten, A. F. T. (2009). Stress signalling pathways that impair prefrontal cortex structure and function. Nature Reviews Neuroscience, 10(6), 410–422.
- Babor, T. F., Hofmann, M., DelBoca, F. K., Hesselbrock, V. M., Meyer, R. E., Dolinsky, Z. S., et al. (1992). Types of alcoholics: I. Evidence for an empirically derived typology based on indicators of vulnerability and severity. Archives of General Psychiatry, 49(8), 599–608.
- Baler, R. D., & Volkow, N. D. (2006). Drug addiction: The neurobiology of disrupted self-control. Trends in Molecular Medicine, 12(12), 559–566.
- Bates, M. E., Buckman, J. F., & Nguyen, T. T. (2013). A role for cognitive rehabilitation in increasing the effectiveness of treatment for alcohol use disorders. *Neuropsychology Review*, 23(1), 27–47.
- Bauer, D. L., Whitman, L. A., & Kosson, D. S. (2011). Reliability and construct validity of Psychopathy Checklist: Youth Version scores among incarcerated adolescent girls. *Criminal Justice and Behavior*, 38(10), 965–987.
- Bauer, L. O., & Hesselbrock, V. M. (2003). Brain maturation and subtypes of conduct disorder: Interactive effects on P300 amplitude and topography in male adolescents. Journal of the American Academy of Child and Adolescent Psychiatry, 42(1), 106–115.
- Beach, S. R. H., Brody, G. H., Lei, M. K., Gibbons, F. X., Gerrard, M., Simons, R. L., et al. (2013). Impact of child sex abuse on adult psychopathology: A genetically and epigenetically informed investigation. *Journal of Family Psychology*, 27(1), 3–11.
- Beauchaine, T. P., & McNulty, T. (2013). Comorbidities and continuities as ontogenic processes: Toward a developmental spectrum model of externalizing psychopathology. *Development and Psychopathology*, 25(4, Pt. 2), 1505–1528.
- Beauchaine, T. P., Neuhaus, E., Zalewski, M., Crowell, S. E., & Potapova, N. (2011). The effects of allostatic

load on neural systems subserving motivation, mood regulation, and social affiliation. *Development and Psychopathology*, 23(4), 975–999.

- Beaver, K. M., Wright, J. P., Boutwell, B. B., Barnes, J. C., DeLisi, M., & Vaughn, M. G. (2013). Exploring the association between the 2-repeat allele of the MAOA gene promoter polymorphism and psychopathic personality traits, arrests, incarceration, and lifetime antisocial behavior. *Personality and Individual Differences*, 54(2), 164–168.
- Bechara, A., & Damasio, H. (2002). Decision-making and addiction: Part 1. Impaired activation of somatic states in substance dependent individuals when pondering decisions with negative future consequences. *Neuropsychologia*, 40(10), 1675–1689.
- Begleiter, H., Porjesz, B., Bihari, B., & Kissin, B. (1984). Event-related brain potentials in boys at risk for alcoholism. Science, 225, 1493–1496.
- Benning, S. D., Patrick, C. J., Blonigen, D. M., Hicks, B. M., & Iacono, W. G. (2005). Estimating facets of psychopathy from normal personality traits: A step toward community epidemiological investigations. Assessment, 12(1), 3–18.
- Benning, S. D., Patrick, C. J., Hicks, B. M., Blonigen, D. M., & Krueger, R. F. (2003). Factor structure of the Psychopathic Personality Inventory: Validity and implications for clinical assessment. *Psychological As*sessment, 15(3), 340–350.
- Berman, S. M., Noble, E. P., Antolin, T., Sheen, C., Conner, B. T., & Ritchie, T. (2006). P300 development during adolescence: Effects of DRD2 genotype. *Clinical Neurophysiology*, 117(3), 649–659.
- Bickel, W. K., Yi, R., Landes, R. D., Hill, P. F., & Baxter, C. (2011). Remember the future: Working memory training decreases delay discounting among stimulant addicts. *Biological Psychiatry*, 69(3), 260–265.
- Blackburn, R., & Coid, J. W. (1998). Psychopathy and the dimensions of personality disorders in violent offenders. *Personality and Individual Differences*, 25(1), 129–145.
- Blackburn, R., Logan, C., Donnelly, J., & Renwick, S. (2003). Personality disorders, psychopathy and other mental disorders: Co-morbidity among patients at English and Scottish high-security hospitals. *Journal* of Forensic Psychiatry and Psychology, 14(1), 111–137.
- Blonigen, D. M. (2010). Explaining the relationship between age and crime: Contributions from the developmental literature on personality. *Clinical Psychol*ogy *Review*, 30(1), 89–100.
- Blonigen, D. M., Hicks, B. M., Krueger, R. F., Patrick, C. J., & Iacono, W. G. (2005). Psychopathic personality traits: Heritability and genetic overlap with internalizing and externalizing psychopathology. *Psychological Medicine*, 35(5), 637–648.
- Blonigen, D. M., Littlefield, A. K., Hicks, B. M., & Sher, K. J. (2010). Course of antisocial behavior during emerging adulthood: Developmental differences in personality. *Journal of Research in Personality*, 44(6), 729–733.

- Blonigen, D. M., Patrick, C. J., Douglas, K. S., Poythress, N. G., Skeem, J. L., Lilienfeld, S. O., et al. (2010). Multimethod assessment of psychopathy in relation to factors of internalizing and externalizing from the Personality Assessment Inventory: The impact of method variance and suppressor effects. *Psychological Assessment*, 22(1), 96–107.
- Boettiger, C. A., Mitchell, J. M., Tavares, V. C., Robertson, M., Joslyn, G., D'Esposito, M., et al. (2007). Immediate reward bias in humans: Fronto-parietal networks and a role for the catechol-O-methyltransferase 158(Val/Val) genotype. Journal of Neuroscience, 27, 14383–14391.
- Borduin, C. M., Schaeffer, C. M., & Heiblum, N. (2009). A randomized clinical trial of multisystemic therapy with juvenile sexual offenders: Effects on youth social ecology and criminal activity. *Journal of Consulting and Clinical Psychology*, 77(1), 26–37.
- Bousman, C. A., Glatt, S. J., Everall, I. P., & Tsuang, M. T. (2009). Genetic association studies of methamphetamine use disorders: A systematic review and synthesis. American Journal of Medical Genetics B: Neuropsychiatric Genetics, 150(8), 1025–1049.
- Brorson, H. H., Ajo Arnevik, E., Rand-Hendriksen, K., & Duckert, F. (2013). Drop-out from addiction treatment: A systematic review of risk factors. *Clinical Psychology Review*, 33(8), 1010–1024.
- Bucholz, K. K., Heath, A. C., Reich, T., Hesselbrock, V. M., Kramer, J. R., Nurnberger, J. I., Jr., et al. (1996). Can we subtype alcoholism?: A latent class analysis of data from relatives of alcoholics in a multicenter family study of alcoholism. Alcoholism: Clinical and Experimental Research, 20(8), 1462–1471.
- Burns, L., Teesson, M., & O'Neill, K. (2005). The impact of comorbid anxiety and depression on alcohol treatment outcomes. Addiction, 100(6), 787–796.
- Bush, G., Luu, P., & Posner, M. I. (2000). Cognitive and emotional influences in anterior cingulate cortex. *Trends in Cognitive Sciences*, 4(6), 215–222.
- Cacciola, J. S., Alterman, A. I., Rutherford, M. J., McKay, J. R., & Mulvaney, F. D. (2001). The relationship of psychiatric comorbidity to treatment outcomes in methadone maintained patients. *Drug and Alcohol Dependence*, 61(3), 271–280.
- Carter, C. S., Braver, T. S., Barch, D. M., Botvinick, M. M., Noll, D., & Cohen, J. D. (1998). Anterior cingulate cortex, error detection, and the online monitoring of performance. *Science*, 280, 747–749.
- Caspi, A., McClay, J., Moffitt, T. E., Mill, J., Martin, J., Craig, I. W., et al. (2002). Role of genotype in the cycle of violence in maltreated children. *Science*, 297, 851–854.
- Chávez, J. X., Dinsmore, J. A., & Hof, D. D. (2010). Assessing the incidence rates of substance use disorders among those with antisocial and borderline personality disorders in rural settings. *International Journal of Psychology: A Biopsychosocial Approach*, 6, 57–66.
- Chien, C.-C., Lin, C.-H., Chang, Y.-Y., & Lung, F.-W.

(2010). Association of VNTR polymorphisms in the MAOA promoter and DRD4 exon 3 with heroin dependence in male Chinese addicts. *World Journal of Biological Psychiatry*, 11(2, Pt. 2), 409–416.

- Childress, A. R., Mozley, P. D., McElgin, W., Fitzgerald, J., Reivich, M., & O'Brien, C. P. (1999). Limbic activation during cue-induced cocaine craving. American Journal of Psychiatry, 156(1), 11–18.
- Claus, E. D., & Hutchison, K. E. (2012). Neural mechanisms of risk taking and relationships with hazardous drinking. Alcoholism: Clinical and Experimental Research, 36(6), 932–940.
- Claus, E. D., Kiehl, K. A., & Hutchison, K. E. (2011). Neural and behavioral mechanisms of impulsive choice in alcohol use disorder. *Alcoholism: Clinical* and Experimental Research, 35(7), 1209–1219.
- Cleckley, H. (1976). The mask of sanity: An attempt to clarify some issues about the so-called psychopathic personality (3rd ed.). St Louis, MO: Mosby.
- Cloninger, C. R. (1987). Neurogenetic adaptive mechanisms in alcoholism. *Science*, 236, 410–416.
- Coid, J., Yang, M., Ullrich, S., Roberts, A., & Hare, R. D. (2009). Prevalence and correlates of psychopathic traits in the household population of Great Britain. *International Journal of Law and Psychiatry*, 32(2), 65–73.
- Colins, O. F., Bijttebier, P., Broekaert, E., & Andershed, H. (2013). Psychopathic-like traits among detained female adolescents: Reliability and validity of the Antisocial Process Screening Device and the Youth Psychopathic Traits Inventory. Assessment, 21(2), 195–209.
- Compton, W. M., Conway, K. P., Stinson, F. S., Colliver, J. D., & Grant, B. F. (2005). Prevalence, correlates, and comorbidity of DSM-IV antisocial personality syndromes and alcohol and specific drug use disorders in the United States: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. Journal of Clinical Psychiatry, 66(6), 677–685.
- Compton, W. M., III, Cottler, L. B., Jacobs, J. L., Ben-Abdallah, A., & Spitznagel, E. L. (2003). The role of psychiatric disorders in predicting drug dependence treatment outcomes. *American Journal of Psychiatry*, 160(5), 890–895.
- Compton, W. M., Thomas, Y. F., Stinson, F. S., & Grant, B. F. (2007). Prevalence, correlates, disability, and comorbidity of DSM-IV drug abuse and dependence in the United States: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. Archives of General Psychiatry, 64(5), 566–576.
- Contini, V., Marques, F. Z. C., Garcia, C. E. D., Hutz, M. H., & Bau, C. H. D. (2006). MAOA-uVNTR polymorphism in a Brazilian sample: Further support for the association with impulsive behaviors and alcohol dependence. American Journal of Medical Genetics B: Neuropsychiatric Genetics, 141(3), 305–308.
- Cope, L. M., Vincent, G. M., Jobelius, J. L., Nyalakanti, P. K., Calhoun, V. D., & Kiehl, K. A. (2014, Febru-

ary). Psychopathic traits modulate brain responses to drug cues in incarcerated offenders. *Frontiers in Human Neuroscience*, 8, Article 87.

- Corrado, R. R., Vincent, G. M., Hart, S. D., & Cohen, I. M. (2004). Predictive validity of the Psychopathy Checklist: Youth Version for general and violent recidivism. *Behavioral Sciences and the Law*, 22(1), 5–22.
- Costa, P. T., Jr., & Widiger, T. A. (1994). Personality disorders and the five-factor model of personality (3rd ed.). Washington, DC: American Psychological Association.
- Damasio, A. R. (1994). Descartes' error and the future of human life. *Scientific American*, 271(4), 144.
- Dick, D. M., Agrawal, A., Wang, J. C., Hinrichs, A., Bertelsen, S., Bucholz, K. K., et al. (2007). Alcohol dependence with comorbid drug dependence: Genetic and phenotypic associations suggest a more severe form of the disorder with stronger genetic contribution to risk. Addiction, 102(7), 1131–1139.
- Dick, D. M., Aliev, F., Latendresse, S., Porjesz, B., Schuckit, M., Rangaswamy, M., et al. (2013). How phenotype and developmental stage affect the genes we find: GABRA2 and impulsivity. *Twin Research* and Human Genetics, 16(3), 661–669.
- Dick, D. M., Aliev, F., Wang, J. C., Grucza, R. A., Schuckit, M., Kuperman, S., et al. (2008). Using dimensional models of externalizing psychopathology to aid in gene identification. Archives of General Psychiatry, 65(3), 310–318.
- Dikman, Z. V., & Allen, J. J. (2000). Error monitoring during reward and avoidance learning in high- and low-socialized individuals. *Psychophysiology*, 37(1), 43–54.
- Duncan, L. E., Pollastri, A. R., & Smoller, J. W. (2014). Mind the gap: Why many geneticists and psychological scientists have discrepant views about gene–environment interaction (G×E) research. American Psychologist, 69(3), 249–268.
- Durbeej, N., Palmstierna, T., Berman, A. H., Kristiansson, M., & Gumpert, C. H. (2014). Offenders with mental health problems and problematic substance use: Affective psychopathic personality traits as potential barriers to participation in substance abuse interventions. *Journal of Substance Abuse Treatment*, 46(5), 574–583.
- Ellingson, J. M., Fleming, K. A., Vergés, A., Bartholow, B. D., & Sher, K. J. (2014). Working memory as a moderator of impulsivity and alcohol involvement: Testing the cognitive–motivational theory of alcohol use with prospective and working memory updating data. Addictive Behaviors, 39(11), 1622–1631.
- Etkin, A., Egner, T., Peraza, D. M., Kandel, E. R., & Hirsch, J. (2006). Resolving emotional conflict: A role for the rostral anterior cingulate cortex in modulating activity in the amygdala. *Neuron*, 51(6), 871–882.
- Fenton, M. C., Keyes, K., Geier, T., Greenstein, E.,

Skodol, A., Krueger, B., et al. (2012). Psychiatric comorbidity and the persistence of drug use disorders in the United States. *Addiction*, 107(3), 599–609.

- Firestone, P., Bradford, J. M., McCoy, M., Greenberg, D. M., Larose, M. R., & Curry, S. (1999). Prediction of recidivism in incest offenders. *Journal of Interpersonal Violence*, 14(5), 511–531.
- Foroud, T., Edenberg, H. J., Goate, A., Rice, J., Flury, L., Koller, D. L., et al. (2000). Alcoholism susceptibility loci: Confirmation studies in a replicate sample and further mapping. Alcoholism: Clinical and Experimental Research, 24(7), 933–945.
- Forth, A. E., Kosson, D. S., & Hare, R. D. (2003). Hare Psychopathy Checklist: Youth Version (PCL:YV). Toronto: Multi-Health Systems.
- Fowler, T., Langley, K., Rice, F., van den Bree, M. B. M., Ross, K., Wilkinson, L. S., et al. (2009). Psychopathy trait scores in adolescents with childhood ADHD: The contribution of genotypes affecting MAOA, 5HTT and COMT activity. *Psychiatric Genetics*, 19(6), 312–319.
- Fridell, M., Hesse, M., & Johnson, E. (2006). High prognostic specificity of antisocial personality disorder in patients with drug dependence: Results from a fiveyear follow-up. American Journal on Addictions, 15(3), 227–232.
- Gallinat, J., Bajbouj, M., Sander, T., Schlattmann, P., Xu, K., Ferro, E. F., et al. (2003). Association of the G1947A COMT (Val(108/158)Met) gene polymorphism with prefrontal P300 during information processing. *Biological Psychiatry*, 54(1), 40–48.
- Gillespie, N. A., Neale, M. C., Jacobson, K., & Kendler, K. S. (2009). Modeling the genetic and environmental association between peer group deviance and cannabis use in male twins. Addiction, 104(3), 420–429.
- Gizer, I. R., Otto, J. M., & Ellingson, J. M. (2016). Molecular genetics of the externalizing spectrum. In T. P. Beauchaine & S. P. Hinshaw (Eds.), Oxford handbook of externalizing spectrum disorders (pp. 149–169). New York: Oxford University Press.
- Glenn, A. L. (2011). The other allele: Exploring the long allele of the serotonin transporter gene as a potential risk factor for psychopathy: A review of the parallels in findings. *Neuroscience and Biobehavioral Reviews*, 35(3), 612–620.
- Goldstein, R. B., Dawson, D. A., Saha, T. D., Ruan, W. J., Compton, W. M., & Grant, B. F. (2007). Antisocial behavioral syndromes and DSM-IV alcohol use disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. Alcoholism: Clinical and Experimental Research, 31(5), 814– 828.
- Goldstein, R. B., & Grant, B. F. (2009). Three-year follow-up of syndromal antisocial behavior in adults: Results from the Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions. *Journal* of Clinical Psychiatry, 70(9), 1237–1249.
- Gorenstein, E. E., & Newman, J. P. (1980). Disinhibito-

ry psychopathology: A new perspective and a model for research. *Psychological Review*, 87(3), 301–315.

- Gorwood, P., Strat, Y. L., Ramoz, N., Dubertret, C., Moalic, J.-M., & Simonneau, M. (2012). Genetics of dopamine receptors and drug addiction. *Human Genetics*, 131(6), 803–822.
- Grabenhorst, F., & Rolls, E. T. (2011). Value, pleasure and choice in the ventral prefrontal cortex. *Trends in Cognitive Sciences*, 15(2), 56–67.
- Grant, B. F., Hasin, D. S., Stinson, F. S., Dawson, D. A., Chou, S. P., Ruan, W. J., et al. (2004). Prevalence, correlates, and disability of personality disorders in the United States: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Clinical Psychiatry*, 65(7), 948–958.
- Grant, B. F., & Kaplan, K. K. (2005). Source and accuracy statement for the Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.
- Grant, B. F., Stinson, F. S., Dawson, D. A., Chou, S. P., Ruan, W. J., & Pickering, R. P. (2006). Co-occurrence of 12-month alcohol and drug use disorders and personality disorders in the United States. *Alcohol Research and Health*, 29(2), 121–130.
- Grüsser, S. M., Wrase, J., Klein, S., Hermann, D., Smolka, M. N., Ruf, M., et al. (2004). Cue-induced activation of the striatum and medial prefrontal cortex is associated with subsequent relapse in abstinent alcoholics. *Psychopharmacology*, 175(3), 296–302.
- Gudonis, L. C., Derefinko, K., & Giancola, P. R. (2009). The treatment of substance misuse in psychopathic individuals: Why heterogeneity matters. Substance Use and Misuse, 44(9–10), 1415–1433.
- Hall, J. R., Benning, S. D., & Patrick, C. J. (2004). Criterion-related validity of the three-factor model of psychopathy: Personality, behavior, and adaptive functioning. Assessment, 11(1), 4–16.
- Hall, J. R., Bernat, E. M., & Patrick, C. J. (2007). Externalizing psychopathology and the error-related negativity. *Psychological Science*, 18(4), 326–333.
- Halperin, J. M., & Schulz, K. P. (2006). Revisiting the role of the prefrontal cortex in the pathophysiology of attention-deficit/hyperactivity disorder. *Psychological Bulletin*, 132(4), 560–581.
- Hare, R. D. (1965). Temporal gradient of fear arousal in psychopaths. Journal of Abnormal Psychology, 70(6), 442–445.
- Hare, R. D. (2003). The Hare Psychopathy Checklist— Revised (2nd ed.). Toronto: Multi-Health Systems.
- Hare, R. D., & Neumann, C. S. (2008). Psychopathy as a clinical and empirical construct. Annual Review of Clinical Psychology, 4, 217–246.
- Harpur, T. J., Hare, R. D., & Ralph, A. (1989). Twofactor conceptualization of psychopathy: Construct validity and assessment implications. *Psychological Assessment*, 1(1), 6–17.
- Harpur, T. J., Ralph, A., & Hare, R. D. (1988). Factor

structure of the Psychopathy Checklist. Journal of Consulting and Clinical Psychology, 56(5), 741–747.

- Hart, S. D., Forth, A. E., & Hare, R. D. (1991). The MCMI-II and psychopathy. *Journal of Personality Dis*orders, 5(4), 318–327.
- Hart, S. D., Hare, R. D., & Cox, D. N. (1995). The Hare Psychopathy Checklist: Screening Version (PCL:SV). Toronto: Multi-Health Systems.
- Harvey, P. D., Stokes, J. L., Lord, J., & Pogge, D. L. (1996). Neurocognitive and personality assessment of adolescent substance abusers: A multidimensional approach. Assessment, 3(3), 241–253.
- Hasin, D. S., Fenton, M. C., Skodol, A., Krueger, R., Keyes, K., Geier, T., et al. (2011). Personality disorders and the 3-year course of alcohol, drug, and nicotine use disorders. Archives of General Psychiatry, 68(11), 1158–1167.
- Hasin, D. S., O'Brien, C. P., Auriacombe, M., Borges, G., Bucholz, K., Budney, A., et al. (2013). DSM-5 criteria for substance use disorders: Recommendations and rationale. *American Journal of Psychiatry*, 170(8), 834–851.
- Hasin, D. S., Stinson, F. S., Ogburn, E., & Grant, B. F. (2007). Prevalence, correlates, disability, and comorbidity of DSM-IV alcohol abuse and dependence in the United States: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. Archives of General Psychiatry, 64(7), 830–842.
- Heath, A. C., Bucholz, K. K., Madden, P. A. F., Dinwiddie, S. H., Slutske, W. S., Bierut, L. J., et al. (1997). Genetic and environmental contributions to alcohol dependence risk in a national twin sample: Consistency of findings in women and men. *Psychological Medicine*, 27(6), 1381–1396.
- Heatherton, T. F. (2011). Neuroscience of self and selfregulation. Annual Review of Psychology, 62, 363–390.
- Heinz, A., Siessmeier, T., Wrase, J., Hermann, D., Klein, S., Grüsser, S. M., et al. (2004). Correlation between dopamine D(2) receptors in the ventral striatum and central processing of alcohol cues and craving. American Journal of Psychiatry, 161(10), 1783–1789.
- Heinz, A., & Smolka, M. N. (2006). The effects of catechol O-methyltransferase genotype on brain activation elicited by affective stimuli and cognitive tasks. *Reviews in the Neurosciences*, 17(3), 359–367.
- Hemphälä, M., & Tengström, A. (2010). Associations between psychopathic traits and mental disorders among adolescents with substance use problems. British Journal of Clinical Psychology, 49(Pt. 1), 109–122.
- Hemphill, J. F., Hart, S. D., & Hare, R. D. (1994). Psychopathy and substance use. *Journal of Personality Disorders*, 8(3), 169–180.
- Henggeler, S. W., Halliday-Boykins, C. A., Cunningham, P. B., Randall, J., Shapiro, S. B., & Chapman, J. E. (2006). Juvenile drug court: Enhancing outcomes by integrating evidence-based treatments. *Journal of Consulting and Clinical Psychology*, 74(1), 42–54.
- Hicks, B. M., Bernat, E., Malone, S. M., Iacono, W. G.,

Patrick, C. J., Krueger, R. F., et al. (2007). Genes mediate the association between P3 amplitude and externalizing disorders. *Psychophysiology*, 44(1), 98–105.

- Hill, S. Y., Jones, B. L., Holmes, B., Steinhauer, S. R., Zezza, N., & Stiffler, S. (2013). Cholinergic receptor gene (CHRM2) variation and familial loading for alcohol dependence predict childhood developmental trajectories of P300. *Psychiatry Research*, 209(3), 504–511.
- Hill, S. Y., Zezza, N., Wipprecht, G., Xu, J., & Neiswanger, K. (1999). Linkage studies of D2 and D4 receptor genes and alcoholism. *American Journal of Medical Genetics*, 88(6), 676–685.
- Hillege, S., Das, J., & de Ruiter, C. (2010). The Youth Psychopathic Traits Inventory: Psychometric properties and its relation to substance use and interpersonal style in a Dutch sample of non-referred adolescents. *Journal of Adolescence*, 33(1), 83–91.
- Hirschi, T., & Gottfredson, M. (1983). Age and the explanation of crime. American Journal of Sociology, 89(3), 552–584.
- Holzinger, K. J., & Swineford, F. (1937). The bi-factor method. Psychometrika, 2(1), 41–54.
- Hopley, A. A. B., & Brunelle, C. (2012). Personality mediators of psychopathy and substance dependence in male offenders. Addictive Behaviors, 37(8), 947–955.
- Iacono, W. G., Carlson, S. R., Taylor, J., Elkins, I. J., & McGue, M. (1999). Behavioral disinhibition and the development of substance-use disorders: Findings from the Minnesota Twin Family Study. *Development* and Psychopathology, 11(4), 869–900.
- Insel, T., Cuthbert, B., Garvey, M., Heinssen, R., Pine, D. S., Quinn, K., et al. (2010). Research domain criteria (RDoC): Toward a new classification framework for research on mental disorders. *American Journal of Psychiatry*, 167(7), 748–751.
- Jang, K. L., Vernon, P. A., & Livesley, W. J. (2000). Personality disorder traits, family environment, and alcohol misuse: A multivariate behavioural genetic analysis. Addiction, 95(6), 873–888.
- Johnson, R., Jr., & Donchin, E. (1978). On how P300 amplitude varies with the utility of the eliciting stimuli. Electroencephalography and Clinical Neurophysiology, 44(4), 424–437.
- Jones, K. A., Porjesz, B., Almasy, L., Bierut, L. J., Goate, A., Wang, J. C., et al. (2004). Linkage and linkage disequilibrium of evoked EEG oscillations with CHRM2 receptor gene polymorphisms: Implications for human brain dynamics and cognition. *International Journal of Psychophysiology*, 53(2), 75–90.
- Karoly, H. C., Harlaar, N., & Hutchison, K. E. (2013). Substance use disorders: A theory-driven approach to the integration of genetics and neuroimaging. Annals of the New York Academy of Sciences, 1282, 71–91.
- Kendler, K. S., Aggen, S. H., Prescott, C. A., Crabbe, J., & Neale, M. C. (2012). Evidence for multiple genetic factors underlying the DSM-IV criteria for alcohol dependence. *Molecular Psychiatry*, 17(12), 1306–1315.

- Kennealy, P. J., Hicks, B. M., & Patrick, C. J. (2007). Validity of factors of the Psychopathy Checklist— Revised in female prisoners: Discriminant relations with antisocial behavior, substance abuse, and personality. Assessment, 14(4), 323–340.
- Kerns, J. G. (2006). Anterior cingulate and prefrontal cortex activity in an FMRI study of trial-to-trial adjustments on the Simon task. *NeuroImage*, 33(1), 399–405.
- Kerns, J. G., Cohen, J. D., MacDonald, A. W., III, Cho, R. Y., Stenger, V. A., & Carter, C. S. (2004). Anterior cingulate conflict monitoring and adjustments in control. *Science*, 303, 1023–1026.
- Kessler, R. C., Crum, R. M., Warner, L. A., Nelson, C. B., Schulenberg, J., & Anthony, J. C. (1997). Lifetime co-occurrence of DSM-III-R alcohol abuse and dependence with other psychiatric disorders in the National Comorbidity Survey. Archives of General Psychiatry, 54(4), 313–321.
- Kiehl, K. A., Bates, A. T., Laurens, K. R., Hare, R. D., & Liddle, P. F. (2006). Brain potentials implicate temporal lobe abnormalities in criminal psychopaths. *Journal of Abnormal Psychology*, 115(3), 443–453.
- Kiehl, K. A., Hare, R. D., Liddle, P. F., & McDonald, J. J. (1999). Reduced P300 responses in criminal psychopaths during a visual oddball task. *Biological Psychiatry*, 45(11), 1498–1507.
- Kiehl, K. A., Smith, A. M., Hare, R. D., & Liddle, P. F. (2000). An event-related potential investigation of response inhibition in schizophrenia and psychopathy. *Biological Psychiatry*, 48(3), 210–221.
- Knight, R. F. (1937). The psychodynamics of chronic alcoholism. Journal of Nervous and Mental Disease, 86(5), 538–548.
- Kochanska, G., Murray, K. T., & Harlan, E. T. (2000). Effortful control in early childhood: Continuity and change, antecedents, and implications for social development. *Developmental Psychology*, 36(2), 220–232.
- Koenigs, M., Kruepke, M., & Newman, J. P. (2010). Economic decision-making in psychopathy: A comparison with ventromedial prefrontal lesion patients. *Neuropsychologia*, 48(7), 2198–2204.
- Koller, G., Bondy, B., Preuss, U. W., Bottlender, M., & Soyka, M. (2003). No association between a polymorphism in the promoter region of the MAOA gene with antisocial personality traits in alcoholics. *Alcohol and Alcoholism*, 38(1), 31–34.
- Koopmans, J. R., Slutske, W. S., Heath, A. C., Neale, M. C., & Boomsma, D. I. (1999). The genetics of smoking initiation and quantity smoked in Dutch adolescent and young adult twins. *Behavior Genetics*, 29(6), 383–393.
- Kotov, R., Gamez, W., Schmidt, F., & Watson, D. (2010). Linking "big" personality traits to anxiety, depressive, and substance use disorders: A meta-analysis. *Psychological Bulletin*, 136(5), 768–821.
- Krueger, R. F. (1999). The structure of common men-

tal disorders. Archives of General Psychiatry, 56(10), 921–926.

- Krueger, R. F. (2002). Personality from a realist's perspective: Personality traits, criminal behaviors, and the externalizing spectrum. *Journal of Research in Per*sonality, 36(6), 564–572.
- Krueger, R. F., Caspi, A., Moffitt, T. E., & Silva, P. A. (1998). The structure and stability of common mental disorders (DSM-III-R): A longitudinal-epidemiological study. *Journal of Abnormal Psychology*, 107(2), 216–227.
- Krueger, R. F., Hicks, B. M., Patrick, C. J., Carlson, S. R., Iacono, W. G., & McGue, M. (2002). Etiologic connections among substance dependence, antisocial behavior and personality: Modeling the externalizing spectrum. *Journal of Abnormal Psychology*, 111(3), 411–424.
- Krueger, R. F., & Markon, K. E. (2006a). Reinterpreting comorbidity: A model-based approach to understanding and classifying psychopathology. Annual Review of Clinical Psychology, 2, 111–133.
- Krueger, R. F., & Markon, K. E. (2006b). Understanding psychopathology: Melding behavior genetics, personality, and quantitative psychology to develop an empirically based model. *Current Directions in Psychological Science*, 15(3), 113–117.
- Krueger, R. F., Markon, K. E., Patrick, C. J., Benning, S. D., & Kramer, M. D. (2007). Linking antisocial behavior, substance use, and personality: An integrative quantitative model of the adult externalizing spectrum. *Journal of Abnormal Psychology*, 116(4), 645.
- Krueger, R. F., McGue, M., & Iacono, W. G. (2001). The higher-order structure of common DSM mental disorders: Internalization, externalization, and their connections to personality. *Personality and Individual Differences*, 30(7), 1245–1259.
- Krueger, R. F., Skodol, A. E., Livesley, W. J., Shrout, P. E., & Huang, Y. (2007). Synthesizing dimensional and categorical approaches to personality disorders: Refining the research agenda for DSM-V Axis II. International Journal of Methods in Psychiatric Research, 16(Suppl. 1), S65–S73.
- Laakso, A., Pohjalainen, T., Bergman, J., Kajander, J., Haaparanta, M., Solin, O., et al. (2005). The A1 allele of the human D2 dopamine receptor gene is associated with increased activity of striatal L-amino acid decarboxylase in healthy subjects. *Pharmacogenetics* and Genomics, 15(6), 387–391.
- Larsson, H., Andershed, H., & Lichtenstein, P. (2006). A genetic factor explains most of the variation in the psychopathic personality. *Journal of Abnormal Psychology*, 115(2), 221–230.
- Le Foll, B., Gallo, A., Le Strat, Y., Lu, L., & Gorwood, P. (2009). Genetics of dopamine receptors and drug addiction: A comprehensive review. *Behavioural Pharmacology*, 20(1), 1–17.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure

of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment*, 66(3), 488–524.

- Lilienfeld, S. O., Widows, M. R., & PAR Staff. (2005). Psychopathic Personality Inventory—Revised. Social Influence, 61, 97.
- Littlefield, A. K., & Sher, K. J. (2016). Personality and substance use disorders. In K. J. Sher (Ed.), *The* handbook of substance use and substance use disorders (Vol. 1, pp. 351–374). New York: Oxford University Press.
- Littlefield, A. K., Sher, K. J., & Wood, P. K. (2009). Is "maturing out" of problematic alcohol involvement related to personality change? *Journal of Abnormal Psychology*, 118(2), 360–374.
- Loney, B. R., Taylor, J., Butler, M. A., & Iacono, W. G. (2007). Adolescent psychopathy features: 6-year temporal stability and the prediction of externalizing symptoms during the transition to adulthood. Aggressive Behavior, 33(3), 242–252.
- Lotta, T., Vidgren, J., Tilgmann, C., Ulmanen, I., Melén, K., Julkunen, I., et al. (1995). Kinetics of human soluble and membrane-bound catechol O-methyltransferase: A revised mechanism and description of the thermolabile variant of the enzyme. *Biochemistry*, 34(13), 4202–4210.
- Lu, R.-B., Lin, W.-W., Lee, J.-F., Ko, H.-C., & Shih, J. C. (2003). Neither antisocial personality disorder nor antisocial alcoholism is associated with the MAO-A gene in Han Chinese males. *Alcoholism: Clinical and Experimental Research*, 27(6), 889–893.
- Lynam, D. R. (2002). Fledgling psychopathy: A view from personality theory. Law and Human Behavior, 26(2), 255–259.
- Lynam, D. R., & Derefinko, K. J. (2006). Psychopathy and personality. In C. J. Patrick (Ed.), *Handbook of* psychopathy (pp. 133–155). New York: Guilford Press.
- Lynam, D. R., & Gudonis, L. (2005). The development of psychopathy. Annual Review of Clinical Psychology, 1, 381–407.
- Lynam, D. R., Hoyle, R. H., & Newman, J. P. (2006). The perils of partialling: Cautionary tales from aggression and psychopathy. Assessment, 13(3), 328–341.
- Maher, B. (2008). The case of the missing heritability. Nature, 456, 18–21.
- Mailloux, D. L., Forth, A. E., & Kroner, D. G. (1997). Psychopathy and substance use in adolescent male offenders. Psychological Reports, 81(2), 529–530.
- Malouff, J. M., Thorsteinsson, E. B., & Schutte, N. S. (2005). The relationship between the five-factor model of personality and symptoms of clinical disorders: A meta-analysis. Journal of Psychopathology and Behavioral Assessment, 27(2), 101–114.
- Manuck, S. B., Flory, J. D., Ferrell, R. E., Mann, J. J., & Muldoon, M. F. (2000). A regulatory polymorphism of the monoamine oxidase-A gene may be associated with variability in aggression, impulsivity, and central nervous system serotonergic responsivity. *Psychiatry Research*, 95(1), 9–23.

- McHugh, R. K., Hofmann, S. G., Asnaani, A., Sawyer, A. T., & Otto, M. W. (2010). The serotonin transporter gene and risk for alcohol dependence: A meta-analytic review. Drug and Alcohol Dependence, 108(1–2), 1–6.
- McLellan, A. T., Luborsky, L., Woody, G. E., & O'Brien, C. P. (1980). An improved diagnostic evaluation instrument for substance abuse patients: The Addiction Severity Index. *Journal of Nervous and Mental Disease*, 168(1), 26–33.
- McNamee, R. L., Dunfee, K. L., Luna, B., Clark, D. B., Eddy, W. F., & Tarter, R. E. (2008). Brain activation, response inhibition, and increased risk for substance use disorder. Alcoholism: Clinical and Experimental Research, 32(3), 405–413.
- Mellentin, A. I., Skøt, L., Teasdale, T. W., & Habekost, T. (2013). Conscious knowledge influences decisionmaking differently in substance abusers with and without co-morbid antisocial personality disorder. *Scandinavian Journal of Psychology*, 54(4), 292–299.
- Menon, V., Adleman, N. E., White, C. D., Glover, G. H., & Reiss, A. L. (2001). Error-related brain activation during a Go/NoGo response inhibition task. *Human Brain Mapping*, 12(3), 131–143.
- Miller, J. D., Lynam, D. R., Widiger, T. A., & Leukefeld, C. (2001). Personality disorders as extreme variants of common personality dimensions: Can the Five-Factor Model adequately represent psychopathy? *Journal of Personality*, 69(2), 253–276.
- Miller, W. R., & Rollnick, S. (2002). Motivational interviewing: Preparing people for change (2nd ed.). New York: Guilford Press.
- Millon, T., & Davis, R. O. (1996). Disorders of personality: DSM-IV and beyond (2nd ed.). Oxford, UK: Wiley.
- Miltner, W. H., Braun, C. H., & Coles, M. G. (1997). Event-related brain potentials following incorrect feedback in a time-estimation task: Evidence for a "generic" neural system for error detection. Journal of Cognitive Neuroscience, 9(6), 788–798.
- Miyake, A., & Friedman, N. P. (2012). The nature and organization of individual differences in executive functions: Four general conclusions. *Current Directions in Psychological Science*, 21(1), 8–14.
- Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex "frontal lobe" tasks: A latent variable analysis. Cognitive Psychology, 41(1), 49–100.
- Monuteaux, M. C., Biederman, J., Doyle, A. E., Mick, E., & Faraone, S. V. (2009). Genetic risk for conduct disorder symptom subtypes in an ADHD sample: Specificity to aggressive symptoms. *Journal of the American Academy of Child and Adolescent Psychiatry*, 48(7), 757–764.
- Motzkin, J. C., Newman, J. P., Kiehl, K. A., & Koenigs, M. (2011). Reduced prefrontal connectivity in psychopathy. *Journal of Neuroscience*, 31, 17348–17357.
- Mueser, K. T., Crocker, A. G., Frisman, L. B., Drake, R. E., Covell, N. H., & Essock, S. M. (2006). Conduct

disorder and antisocial personality disorder in persons with severe psychiatric and substance use disorders. *Schizophrenia Bulletin*, 32(4), 626–636.

- Mueser, K. T., Gottlieb, J. D., Cather, C., Glynn, S. M., Zarate, R., Smith, L. F., et al. (2012). Antisocial personality disorder in people with co-occurring severe mental illness and substance use disorders: Clinical, functional, and family relationship correlates. *Psychosis*, 4(1), 52–62.
- Munafò, M. R., & Flint, J. (2009). Replication and heterogeneity in gene × environment interaction studies. International Journal of Neuropsychopharmacology, 12(6), 727–729.
- Munafò, M. R., & Flint, J. (2011). Dissecting the genetic architecture of human personality. *Trends in Cognitive Sciences*, 15(9), 395–400.
- Nelson, L. D., Patrick, C. J., & Bernat, E. M. (2011). Operationalizing proneness to externalizing psychopathology as a multivariate psychophysiological phenotype. *Psychophysiology*, 48(1), 64–72.
- Neumann, C. S., & Hare, R. D. (2008). Psychopathic traits in a large community sample: Links to violence, alcohol use, and intelligence. *Journal of Consulting and Clinical Psychology*, 76(5), 893–899.
- Nikolas, M., Friderici, K., Waldman, I., Jernigan, K., & Nigg, J. T. (2010). Gene × environment interactions for ADHD: Synergistic effect of 5HTTLPR genotype and youth appraisals of inter-parental conflict. Behavioral and Brain Functions, 6, Article No. 23.
- Nolen-Hoeksema, S., & Watkins, E. R. (2011). A heuristic for developing transdiagnostic models of psychopathology explaining multifinality and divergent trajectories. *Perspectives on Psychological Science*, 6(6), 589–609.
- O'Neill, M. L., Lidz, V., & Heilbrun, K. (2003a). Adolescents with psychopathic characteristics in a substance abusing cohort: Treatment process and outcomes. Law and Human Behavior, 27(3), 299–313.
- O'Neill, M. L., Lidz, V., & Heilbrun, K. (2003b). Predictors and correlates of psychopathic characteristics in substance abusing adolescents. *International Journal of Forensic Mental Health*, 2(1), 35–45.
- Pailing, P. E., & Segalowitz, S. J. (2004). The error-related negativity as a state and trait measure: Motivation, personality, and ERPs in response to errors. *Psychophysiology*, 41(1), 84–95.
- Pailing, P. E., Segalowitz, S. J., Dywan, J., & Davies, P. L. (2002). Error negativity and response control. Psychophysiology, 39(2), 198–206.
- Pankow, J., & Knight, K. (2012). Asociality and engagement in adult offenders in substance abuse treatment. *Behavioral Sciences and the Law*, 30(4), 371–383.
- Parsian, A., Cloninger, C. R., Sinha, R., & Zhang, Z. H. (2003). Functional variation in promoter region of monoamine oxidase A and subtypes of alcoholism: Haplotype analysis. American Journal of Medical Genetics B: Neuropsychiatric Genetics, 117(1), 46–50.
- Patrick, C. J. (1994). Emotion and psychopathy: Startling new insights. Psychophysiology, 31(4), 319–330.

- Patrick, C. J., & Bernat, E. M. (2009). Neurobiology of psychopathy: A two process theory. In G. G. Berntson & J. T. Cacioppo (Eds.), *Handbook of neuroscience for the behavioral sciences* (Vol. 2, pp. 1110–1131). Hoboken, NJ: Wiley.
- Patrick, C. J., Bernat, E. M., Malone, S. M., Iacono, W. G., Krueger, R. F., & McGue, M. (2006). P300 amplitude as an indicator of externalizing in adolescent males. *Psychophysiology*, 43(1), 84–92.
- Patrick, C. J., Durbin, C. E., & Moser, J. S. (2012). Reconceptualizing antisocial deviance in neurobehavioral terms. *Development and Psychopathology*, 24(3), 1047–1071.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, 21(3), 913–938.
- Patrick, C. J., Kramer, M. D., Krueger, R. F., & Markon, K. E. (2013). Optimizing efficiency of psychopathology assessment through quantitative modeling: Development of a brief form of the Externalizing Spectrum Inventory. *Psychological Assessment*, 25(4), 1332–1348.
- Patrick, C. J., Venables, N. C., Yancey, J. R., Hicks, B. M., Nelson, L. D., & Kramer, M. D. (2013). A construct-network approach to bridging diagnostic and physiological domains: Application to assessment of externalizing psychopathology. *Journal of Abnormal Psychology*, 122(3), 902–916.
- Pettinati, H. M., Sugerman, A. A., & Maurer, H. S. (1982). Four year MMPI changes in abstinent and drinking alcoholics. Alcoholism: Clinical and Experimental Research, 6(4), 487–494.
- Philibert, R. A., Gunter, T. D., Beach, S. R. H., Brody, G. H., & Madan, A. (2008). MAOA methylation is associated with nicotine and alcohol dependence in women. American Journal of Medical Genetics B: Neuropsychiatric Genetics, 147(5), 565–570.
- Polich, J. (2007). Updating P300: An integrative theory of P3a and P3b. *Clinical Neurophysiology*, *118*(10), 2128–2148.
- Ponce, G., Hoenicka, J., Jiménez-Arriero, M. A., Rodríguez-Jiménez, R., Aragüés, M., Martín-Suñé, N., et al. (2008). DRD2 and ANKK1 genotype in alcoholdependent patients with psychopathic traits: Association and interaction study. *British Journal of Psychiatry*, 193(2), 121–125.
- Porjesz, B., Begleiter, H., & Garozzo, R. (1980). Visual evoked potential correlates of information processing deficits in chronic alcoholics. Advances in Experimental Medicine and Biology, 126, 603–623.
- Posner, M. I., & Raichle, M. E. (1994). *Images of mind.* New York: Scientific American Library/Scientific American Books.
- Poythress, N. G., Dembo, R., Wareham, J., & Greenbaum, P. E. (2006). Construct validity of the Youth Psychopathic Traits Inventory (YPI) and the Antisocial Process Screening Device (APSD) with justice-

involved adolescents. Criminal Justice and Behavior, 33(1), 26–55.

- Quay, H. C. (1965). Psychopathic personality as pathological stimulation-seeking. American Journal of Psychiatry, 122, 180–183.
- Raine, A., Lencz, T., Bihrle, S., LaCasse, L., & Colletti, P. (2000). Reduced prefrontal gray matter volume and reduced autonomic activity in antisocial personality disorder. Archives of General Psychiatry, 57(2), 119–127.
- Reardon, M. L., Lang, A. R., & Patrick, C. J. (2002). An evaluation of relations among antisocial behavior, psychopathic traits, and alcohol problems in incarcerated men. Alcoholism: Clinical and Experimental Research, 26(8), 1188–1197.
- Regier, D. A., Farmer, M. E., Rae, D. S., Locke, B. Z., Keith, S. J., Judd, L. L., et al. (1990). Comorbidity of mental disorders with alcohol and other drug abuse. Results from the Epidemiologic Catchment Area (ECA) Study. *Journal of the American Medical Association*, 264(19), 2511–2518.
- Reich, T., Edenberg, H. J., Goate, A., Williams, J. T., Rice, J. P., Van Eerdewegh, P., et al. (1998). Genomewide search for genes affecting the risk for alcohol dependence. *American Journal of Medical Genetics*, 81(3), 207–215.
- Reid, J. (1988). The psychopathic mind: Origins, dynamics, and treatment. Lanham, MD: Aronson.
- Rhee, S. H., Hewitt, J. K., Young, S. E., Corley, R. P., Crowley, T. J., & Stallings, M. C. (2003). Genetic and environmental influences on substance initiation, use, and problem use in adolescents. Archives of General Psychiatry, 60(12), 1256–1264.
- Richards, H. J., Casey, J. O., & Lucente, S. W. (2003). Psychopathy and treatment response in incarcerated female substance abusers. *Criminal Justice and Behavior*, 30(2), 251–276.
- Rose, R. J., Dick, D. M., Viken, R. J., & Kaprio, J. (2001). Gene–environment interaction in patterns of adolescent drinking: Regional residency moderates longitudinal influences on alcohol use. Alcoholism: Clinical and Experimental Research, 25(5), 637–643.
- Ruiz, M. A., Pincus, A. L., & Schinka, J. A. (2008). Externalizing pathology and the five-factor model: A meta-analysis of personality traits associated with antisocial personality disorder, substance use disorder, and their co-occurrence. *Journal of Personality Disorders*, 22(4), 365–388.
- Sabol, S. Z., Hu, S., & Hamer, D. (1998). A functional polymorphism in the monoamine oxidase A gene promoter. *Human Genetics*, 103(3), 273–279.
- Sacks, S., Cleland, C. M., Melnick, G., Flynn, P. M., Knight, K., Friedmann, P. D., et al. (2009). Violent offenses associated with co-occurring substance use and mental health problems: Evidence from CJDATS. Behavioral Sciences and the Law, 27(1), 51–69.
- Sadeh, N., Javdani, S., Jackson, J. J., Reynolds, E. K., Potenza, M. N., Gelernter, J., et al. (2010). Serotonin

transporter gene associations with psychopathic traits in youth vary as a function of socioeconomic resources. *Journal of Abnormal Psychology*, 119(3), 604–609.

- Saito, T., Lachman, H. M., Diaz, L., Hallikainen, T., Kauhanen, J., Salonen, J. T., et al. (2002). Analysis of monoamine oxidase A (MAOA) promoter polymorphism in Finnish male alcoholics. *Psychiatry Research*, 109(2), 113–119.
- Salekin, R. T., Leistico, A.-M. R., Neumann, C. S., DiCicco, T. M., & Duros, R. L. (2004). Psychopathy and comorbidity in a young offender sample: Taking a closer look at psychopathy's potential importance over disruptive behavior disorders. *Journal of Abnor*mal Psychology, 113(3), 416–427.
- Sanislow, C. A., Pine, D. S., Quinn, K. J., Kozak, M. J., Garvey, M. A., Heinssen, R. K., et al. (2010). Developing constructs for psychopathology research: Research domain criteria. *Journal of Abnormal Psychol*ogy, 119(4), 631–639.
- Schellekens, A. F. A., Franke, B., Ellenbroek, B., Cools, A., de Jong, C. A. J., Buitelaar, J. K., et al. (2012). Reduced dopamine receptor sensitivity as an intermediate phenotype in alcohol dependence and the role of the COMT Val158Met and DRD2 Taq1A genotypes. Archives of General Psychiatry, 69(4), 339–348.
- Sharma, L., Kohl, K., Morgan, T. A., & Clark, L. A. (2013). "Impulsivity": Relations between self-report and behavior. *Journal of Personality and Social Psychology*, 104(3), 559–575.
- Sher, K. J., & Gotham, H. J. (1999). Pathological alcohol involvement: A developmental disorder of young adulthood. *Development and Psychopathology*, 11(4), 933–956.
- Sher, K. J., Martinez, J. A., & Littlefield, A. K. (2011). Alcohol use disorders. In D. H. Barlow (Ed.), *Handbook of clinical psychology* (pp. 405–445). New York: Oxford University Press.
- Sher, K. J., & Trull, T. J. (1994). Personality and disinhibitory psychopathology: Alcoholism and antisocial personality disorder. *Journal of Abnormal Psychology*, 103(1), 92–102.
- Slutske, W. S., Heath, A. C., Dinwiddie, S. H., Madden, P. A. F., Bucholz, K. K., Dunne, M. P., et al. (1997). Modeling genetic and environmental influences in the etiology of conduct disorder: A study of 2,682 adult twin pairs. *Journal of Abnormal Psychology*, 106(2), 266–279.
- Slutske, W. S., Heath, A. C., Madden, P. A. F., Bucholz, K. K., Statham, D. J., & Martin, N. G. (2002). Personality and the genetic risk for alcohol dependence. *Journal of Abnormal Psychology*, 111(1), 124–133.
- Smith, G. T., McCarthy, D. M., & Zapolski, T. C. B. (2009). On the value of homogeneous constructs for construct validation, theory testing, and the description of psychopathology. *Psychological Assessment*, 21(3), 272–284.
- Smith, S. S., & Newman, J. P. (1990). Alcohol and drug abuse-dependence disorders in psychopathic and

nonpsychopathic criminal offenders. Journal of Abnormal Psychology, 99(4), 430–439.

- Stacy, A. W., & Wiers, R. W. (2010). Implicit cognition and addiction: A tool for explaining paradoxical behavior. *Annual Review of Clinical Psychology*, 6, 551–575.
- Stitzer, M., & Petry, N. (2006). Contingency management for treatment of substance abuse. Annual Review of Clinical Psychology, 2, 411–434.
- Sutton, S., Braren, M., Zubin, J., & John, E. R. (1965). Evoked-potential correlates of stimulus uncertainty. Science, 150, 1187–1188.
- Sylvers, P., Landfield, K. E., & Lilienfeld, S. O. (2011). Heavy episodic drinking in college students: Associations with features of psychopathy and antisocial personality disorder. *Journal of American College Health*, 59(5), 367–372.
- Tammimäki, A. E., & Männistö, P. T. (2010). Are genetic variants of COMT associated with addiction? *Pharmacogenetics and Genomics*, 20(12), 717–741.
- Tarter, R. E., Kirisci, L., Habeych, M., Reynolds, M., & Vanyukov, M. (2004). Neurobehavior disinhibition in childhood predisposes boys to substance use disorder by young adulthood: Direct and mediated etiologic pathways. Drug and Alcohol Dependence, 73(2), 121–132.
- Taylor, J., & Lang, A. R. (2006). Psychopathy and substance use disorders. In C. J. Patrick (Ed.), *Handbook* of psychopathy (pp. 495–511). New York: Guilford Press.
- Tellegen, A. (1982). Brief manual for the multidimensional personality questionnaire. Unpublished manuscript, University of Minnesota, Minneapolis.
- Tellegen, A., & Waller, N. G. (2008). Exploring personality through test construction: Development of the Multidimensional Personality Questionnaire. In G. J. Boyle, G. Matthews, & D. H. Saklofske (Eds.), The SAGE handbook of personality theory and assessment (Vol. 2, pp. 261–292). Thousand Oaks, CA: SAGE.
- Tikkanen, R., Auvinen-Lintunen, L., Ducci, F., Sjoberg, R. L., Goldman, D., Tiihonen, J., et al. (2011). Psychopathy, PCL-R, and MAOA genotype as predictors of violent reconvictions. *Psychiatry Research*, 185(3), 382–386.
- Tomarken, A. J., & Waller, N. G. (2003). Potential problems with "well fitting" models. *Journal of Abnormal Psychology*, 112(4), 578–598.
- Tragesser, S. L., Trull, T. J., Sher, K. J., & Park, A. (2008). Drinking motives as mediators in the relation between personality disorder symptoms and alcohol use disorder. *Journal of Personality Disorders*, 22(5), 525–537.
- True, W. R., Xian, H., Scherrer, J. F., Madden, P. A., Bucholz, K. K., Heath, A. C., et al. (1999). Common genetic vulnerability for nicotine and alcohol dependence in men. Archives of General Psychiatry, 56(7), 655–661.
- Trull, T. J., Vergés, A., Wood, P. K., Jahng, S., & Sher, K. J. (2012). The structure of *Diagnostic and Statis*-

tical Manual of Mental Disorders (4th edition, text revision) personality disorder symptoms in a large national sample. *Personality Disorders*, 3(4), 355–369.

- Tsai, S. J., Yu, Y. W. Y., Chen, T. J., Chen, J. Y., Liou, Y. J., Chen, M. C., et al. (2003). Association study of a functional catechol-O-methyltransferase-gene polymorphism and cognitive function in healthy females. *Neuroscience Letters*, 338(2), 123–126.
- Tsuang, M. T., Lyons, M. J., Eisen, S. A., Goldberg, J., True, W., Lin, N., et al. (1996). Genetic influences on DSM-III-R drug abuse and dependence: A study of 3,372 twin pairs. American Journal of Medical Genetics, 67(5), 473–477.
- Tuvblad, C., Zheng, M., Raine, A., & Baker, L. A. (2009). A common genetic factor explains the covariation among ADHD ODD and CD symptoms in 9–10 year old boys and girls. *Journal of Abnormal Child Psychology*, 37(2), 153–167.
- Vachon, D. D., Lynam, D. R., Loeber, R., & Stouthamer-Loeber, M. (2012). Generalizing the nomological network of psychopathy across populations differing on race and conviction status. *Journal of Abnormal Psychology*, 121(1), 263–269.
- Vahl, P., Colins, O. F., Lodewijks, H. P. B., Markus, M. T., Doreleijers, T. A. H., & Vermeiren, R. R. J. M. (2014). Psychopathic-like traits in detained adolescents: Clinical usefulness of self-report. *European Child and Adolescent Psychiatry*, 23(8), 691–699.
- van den Bree, M. B. M., Johnson, E. O., Neale, M. C., & Pickens, R. W. (1998). Genetic and environmental influences on drug use and abuse/dependence in male and female twins. *Drug and Alcohol Dependence*, 52(3), 231–241.
- Vanyukov, M. M., Maher, B. S., Devlin, B., Tarter, R. E., Kirillova, G. P., Yu, L.-M., et al. (2004). Haplotypes of the monoamine oxidase genes and the risk for substance use disorders. *American Journal of Medical Genetics B: Neuropsychiatric Genetics*, 125(1), 120–125.
- Vanyukov, M. M., Tarter, R. E., Kirillova, G. P., Kirisci, L., Reynolds, M. D., Kreek, M. J., et al. (2012). Common liability to addiction and "gateway hypothesis": Theoretical, empirical and evolutionary perspective. Drug and Alcohol Dependence, 123 (Suppl. 1), S3–S17.
- Vassos, E., Collier, D. A., & Fazel, S. (2014). Systematic meta-analyses and field synopsis of genetic association studies of violence and aggression. *Molecular Psychiatry*, 19(4), 471–477.
- Venables, N. C., & Patrick, C. J. (2012). Validity of the Externalizing Spectrum Inventory in a criminal offender sample: Relations with disinhibitory psychopathology, personality, and psychopathic features. *Psychological Assessment*, 24(1), 88–100.
- Venables, N. C., & Patrick, C. J. (2014). Reconciling discrepant findings for P3 brain response in criminal psychopathy through reference to the concept of externalizing proneness. *Psychophysiology*, 51(5), 427–436.
- Vergés, A., Kushner, M. G., Jackson, K. M., Bucholz, K.

K., Trull, T. J., Lane, S. P., et al. (2014). Personality disorders and the persistence of anxiety disorders: Evidence of a time-of-measurement effect in NESARC. *Journal of Anxiety Disorders*, 28(2), 178–186.

- Vevera, J., Stopkova, R., Bes, M., Albrecht, T., Papezova, H., Zukov, I., et al. (2009). COMT polymorphisms in impulsively violent offenders with antisocial personality disorder. *Neuro Endocrinology Letters*, 30(6), 753–756.
- Viding, E., Frick, P. J., & Plomin, R. (2007). Aetiology of the relationship between callous–unemotional traits and conduct problems in childhood. *British Journal of Psychiatry*, 49, S33–S38.
- Vitacco, M. J., Neumann, C. S., & Jackson, R. L. (2005). Testing a four-factor model of psychopathy and its association with ethnicity, gender, intelligence, and violence. *Journal of Consulting and Clinical Psychol*ogy, 73(3), 466–476.
- Vitacco, M. J., Rogers, R., Neumann, C. S., Harrison, K. S., & Vincent, G. (2005). A comparison of factor models on the PCL-R with mentally disordered offenders: The development of a four-factor model. *Criminal Justice and Behavior*, 32(5), 526–545.
- Volkow, N. D., & Fowler, J. S. (2000). Addiction, a disease of compulsion and drive: Involvement of the orbitofrontal cortex. *Cerebral Cortex*, 10(3), 318–325.
- Walsh, T. C. (1999). Psychopathic and nonpsychopathic violence among alcoholic offenders. International Journal of Offender Therapy and Comparative Criminology, 43(1), 34–48.
- Walsh, Z., Allen, L. C., & Kosson, D. S. (2007). Beyond social deviance: Substance use disorders and the dimensions of psychopathy. *Journal of Personality Disorders*, 21(3), 273–288.
- Wang, F., Simen, A., Arias, A., Lu, Q., & Zhang, H. (2013). A large-scale meta-analysis of the association between the ANKK1/DRD2 Taq1A polymorphism and alcohol dependence. *Human Genetics*, 132(3), 347–358.
- Weinberg, A., Venables, N. C., Proudfit, G. H., & Patrick, C. J. (2015). Heritability of the neural response to emotional pictures: Evidence from ERPs in an adult twin sample. Social Cognitive and Affective Neuroscience, 10(3), 424–434.
- WHO Assist Working Group. (2002). The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): Development, reliability and feasibility. Addiction, 97(9), 1183–1194.
- Widiger, T. A., & Lynam, D. R. (1998). Psychopathy and the five-factor model of personality. In T. Millon, E. Simonsen, M. Birket-Smith, & R. D. Davis (Eds.), *Psychopathy: Antisocial, criminal, and violent behavior* (pp. 171–187). New York: Guilford Press.
- Widiger, T. A., & Trull, T. J. (1992). Personality and psychopathology: An application of the five-factor model. *Journal of Personality*, 60(2), 363–393.
- Wilson, M. J., Abramowitz, C., Vasilev, G., Bozgunov,

K., & Vassileva, J. (2014). Psychopathy in Bulgaria: The cross-cultural generalizability of the Hare Psychopathy Checklist. *Journal of Psychopathology and Behavioral Assessment*, 36(3), 389–400.

- Winick, C. (1962). Maturing out of narcotic addiction. Bulletin on Narcotics, 14(1), 1–7.
- Winokur, G., Rimmer, J., & Reich, T. (1971). Alcoholism IV: Is there more than one type of alcoholism? *British Journal of Psychiatry*, 118, 525–531.
- Witkiewitz, K., Marlatt, G. A., & Walker, D. (2005). Mindfulness-based relapse prevention for alcohol and substance use disorders. *Journal of Cognitive Psychotherapy*, 19(3), 211–228.
- Wright, M. J., Luciano, M., Hansell, N. K., Montgomery, G. W., Geffen, G. M., & Martin, N. G. (2008). QTLs identified for P3 amplitude in a non-clinical sample: Importance of neurodevelopmental and neurotransmitter genes. *Biological Psychiatry*, 63(9), 864–873.
- Wu, T., & Barnes, J. C. (2013). Two dopamine receptor genes (DRD2 and DRD4) predict psychopathic personality traits in a sample of American adults. *Journal of Criminal Justice*, 41(3), 188–195.
- Yancey, J. R., Venables, N. C., Hicks, B. M., & Patrick, C. J. (2013). Evidence for a heritable brain basis to

deviance-promoting deficits in self-control. *Journal of Criminal Justice*, 41(5), 309–317.

- Yang, Y., Raine, A., Colletti, P., Toga, A. W., & Narr, K. L. (2010). Morphological alterations in the prefrontal cortex and the amygdala in unsuccessful psychopaths. *Journal of Abnormal Psychology*, 119(3), 546–554.
- Yin, J.-J., Ma, S.-H., Xu, K., Wang, Z.-X., Le, H.-B., Huang, J.-Z., et al. (2012). Functional magnetic resonance imaging of methamphetamine craving. *Clinical Imaging*, 36(6), 695–701.
- Young, S. E., Friedman, N. P., Miyake, A., Willcutt, E. G., Corley, R. P., Haberstick, B. C., et al. (2009). Behavioral disinhibition: Liability for externalizing spectrum disorders and its genetic and environmental relation to response inhibition across adolescence. *Journal of Abnormal Psychology*, 118(1), 117–130.
- Young, S. E., Stallings, M. C., Corley, R. P., Krauter, K. S., & Hewitt, J. K. (2000). Genetic and environmental influences on behavioral disinhibition. *American Journal of Medical Genetics*, 96(5), 684–695.
- Zucker, R. A. (1986). The four alcoholisms: A developmental account of the etiologic process. Nebraska Symposium on Motivation, 34, 27–83.

# CHAPTER 27

# The Role of Psychopathy in Sexual Coercion against Women An Update and Expansion

RAYMOND A. KNIGHT JEAN-PIERRE GUAY

n the first volume of the *Handbook of Psychopathy*, Knight and Guay (2006) argued that even though Cleckley's (1988) description and theoretical conceptualization of psychopathy did not include a proclivity to engage in coercive sexual behavior, a strong case could be made that the key symptomatic subdimensions of psychopathy play significant roles in rape. They reviewed evidence from three independent research domains to support their contention.

First, in the general criminal research literature, there were some indications of increased risk for sexual coercion among psychopathic criminals, and this risk was consistent with recent theoretical explanations of particular symptom subdimensions of psychopathy. Second, studies of incarcerated rapists revealed a high incidence of psychopathy, and the facets of psychopathy had emerged as critical elements in an empirically validated typological model that identified important individual differences among rapists. Moreover, psychopathy had been identified as an important predictor of sexual recidivism among convicted rapists. Third, in both offender and nonoffender samples, the symptomatic facets of psychopathy had been identified as traits that define critical paths in structural equation models of the etiology of sexual aggression against women.

In this chapter we first summarize the data that supported each of Knight and Guay's (2006) original arguments, and then we review the research developments since the original chapter that are relevant to each of these arguments. Moreover, recent research demonstrating consistent covariations among aspects of sexual aggression and symptomatic facets of psychopathy has generated hypotheses about potential mechanisms that might be operating in both domains. We review two of these areas: (1) the covariation of hypersexuality with both the Interpersonal facet of the Psychopathy Checklist-Revised (PCL-R; Hare, 2003) and the Callous-Manipulative (CM) higher-order factor of the Multidimensional Inventory of Development, Sex, and Aggression (MIDSA; 2011), and (2) the covariation of psychopathy with sadism. We argue that better differentiation of the mechanisms involved in "impulsivity" might help to clarify the bases of these two consistently found covariation patterns. We contend further that understanding the mechanisms contributing to these covariations can contribute to advancement of the understanding of the facets of psychopathy.

# Prevalence of Sexual Coercion in Psychopathic Offenders

As in our initial evaluation, in the current update of a consideration of the prevalence of sexual coercion among psychopathic offenders we consider a broad range of definitions of psychopathy in the hope that casting our diagnostic net widely will allow a more inclusive assessment of the level of sexually coercive behavior among high-psychopathy individuals. We evaluate the prevalence of coercion both in more narrowly defined personality-based definitions such as that proposed in the PCL-R and in more broad-based antisocial behavior conceptualizations such as the diagnostic criteria for antisocial personality disorder (ASPD) specified in the third through fifth editions of the Diagnostic and Statistical Manual of Mental Disorders (DSM; American Psychiatric Association [APA], 1987, 2000, 2013).

#### Presence of Sexual Coercion in Rating Scales and Diagnostic Criteria for Psychopathy

Knight and Guay (2006) noted that prominent definitions of psychopathy and psychopathy-related constructs have implied a relation between psychopathy and sexual aggression both in their definitional criteria and in official descriptions of psychopathy as a clinical condition (disorder). For example, one of the 20 items of the PCL-R is Promiscuous Sexual Behavior, and proclivity to engage in impersonal sexual behavior constitutes one of the characteristics associated with an increased probability of sexual coercion (e.g., Malamuth, 1998). As in the third and fourth editions of the DSM (DSM-III-R, DSM-IV-TR; APA, 1987, 2000), the diagnostic criteria for ASPD in the current, fifth edition (DSM-5; APA, 2013) have continued to require the occurrence of conduct disorder symptoms before age 15, which include as a criterion sexually coercive behavior ("forced someone into sexual activity"). Consistent with the descriptive text for ASPD in DSM-III-R and DSM-IV-TR, the DSM-5 text also mentions that individuals diagnosed with ASPD may be irresponsible and exploitative in their sexual relationships, and it notes that such individuals may engage in sexual behavior that has a high risk of harmful consequences. Moreover, individuals meeting criteria for ASPD are described as deceitful and manipulative in their attempts to obtain sex.

# Prevalence of Sexual Coercion among Psychopathic Offenders

In our chapter for the first edition of this handbook (Knight & Guay, 2006), we noted in reviewing the empirical literature on the crimes of psychopathic offenders that sexually violent offenses tended to be folded into violent offenses in general in the criminology literature. We were able to locate only one study (Coid, 1992) that had assessed sexual violence specifically in offenders also assessed for psychopathy. Findings from this study provided support for the hypothesis that rape, buggery, and indecent assault are more prevalent among psychopathic offenders than among criminals as a whole. The state of the literature has not changed greatly from then to now. Although (as discussed below) a number of more recent studies have documented associations of psychopathy with various aspects of sexual behavior and fantasy, and a number have reported correlations between measures of psychopathy and sexually coercive behavior in both criminal and noncriminal samples, only one new study since our original review has provided direct evidence of the differential prevalence of sexual coercion among offenders classified as psychopathic versus nonpsychopathic using the PCL-R. Consistent with Coid (1992), Krupp, Sewall, Lalumière, Sheriff, and Harris (2013) found that offenders scoring high on the PCL-R were significantly more likely than those scoring low to have committed a sexual assault. Findings consistent with those of Coid were also obtained by DeGue, DiLillo, and Scalora (2010) in a study of offenders that used self-report to assess for psychopathic traits (Psychopathic Personality Inventory [PPI]; Lilienfeld & Andrews, 1996). They found that three of the four subscales associated with the Self-Centered Impulsivity (ScI) factor of the PPI (Machiavellian Egocentricity, Impulsive Nonconformity, and Carefree Nonplanfulness, but not Blame Externalization) significantly differentiated sexually coercive-aggressive offenders from non-sexually coercive offenders, indicating greater sexually assaultive behavior in those high on psychopathic traits.

# Congruent Explanatory Constructs for Psychopathy and Rape

Knight and Guay (2006) argued that many of the descriptive characteristics and empirically validated emotional and cognitive deficiencies of those high in psychopathy were theoretically congruent
with an increased proclivity for involvement in sexually coercive behavior. For example, the two factors of psychopathy assessed by the PCL-R and their hierarchically embedded facets (Hare, 2003; Hare, Neumann, & Mokros, Chapter 3, this volume) involve cognitions and behaviors that would increase the risk of an individual seeking to sate his sexual desires regardless of his partner's willingness to comply. In particular, individuals high on the PCL-R's Affective-Interpersonal factor are described as heartlessly unconcerned with the feelings of other people. Their hyporesponsivity to distress cues (Blair, 1995; Blair, Mitchell, & Blair, 2005; James, Blair, Jones, Clark, & Smith, 1997) implies that in sexual situations they would be less likely than noncoercive males to inhibit sexual arousal in response to another's distress (Barbaree & Marshall, 1991; Bernat, Calhoun, & Adams, 1999; Lohr, Adams, & Davis, 1997). Moreover, their easy use of charm, flattery, and outright lying (Klaver, Lee, Spidel, & Hart, 2009; Rogers & Cruise, 2000) would allow them to manipulate reluctant sexual partners into complying and would also set the stage for more severe forms of coercion. The covariation of various self-report measures of the Affective-Interpersonal characteristics of psychopathy with scales measuring sexualization (Hypersexuality, Sexual Preoccupation, and Sexual Compulsivity; Graham & Knight, 2017) is also consistent with the enhanced risk for sexually coercive behavior among individuals scoring high on such characteristics.

The disinhibitory tendencies associated with the PCL-R's Impulsive–Antisocial factor may also contribute to maintaining appetitive drive and sexual behavior in circumstances in which victim noncompliance would normally act to inhibit such behavior (Knight & Sims-Knight, 2011). Some data (Yoon & Knight, 2011) suggest that such disinhibitory tendencies might also contribute to the misperception of sexual intent, with individuals high on this factor being more likely to perceive dismissive communications as encouragement, or friendly behavior as seductive.

As described in the initial version of this chapter (Knight & Guay, 2006), evolutionary explanations for sexual coercion have also highlighted the importance of psychopathic tendencies. Most notably, it has been speculated that proclivities toward short-term relationships, high mating effort, and low parental investment on the part of psychopathic individuals (Quinsey & Lalumière, 1995), along with their use of short-term cheating strategies (Mealey, 1995), might coalesce into a high reproduction-rate (r-selection; Pianka, 1970) mating strategy that not only has some evolutionary advantages but also increases the probability of sexual aggression. Although the evidence for such theories remains tentative (Marcus, Sanford, Edens, Knight, & Walters, 2011), recent neurobiological research nonetheless supports the hypothesis that dysfunctions in brain regions that are key to emotional processing and morality judgments may allow psychopathic individuals to pursue this evolutionary strategy (Glenn & Raine, 2009). Moreover, such evolutionary speculation emphasizes the theoretical congruence between characteristics associated with psychopathy and those associated with rape.

In addition to addressing concerns about the empirical support for evolutionary theories, Marcus and colleagues (2011) also considered the important explanatory conundrum of taxometrics and psychopathy that impacts the evaluation of their shared explanatory potential. Although not explicitly stated, research examining the incidence of sexual coercion among "psychopaths" or "antisocial personalities" compared to individuals not so classified has in effect treated psychopathy as a category or taxon. The issue of determining the latent structure of a construct is important in general as a guide to determining maximal cutoffs for dispositional and diagnostic decisions, directing research strategies, and formulating etiological models (Ruscio, Haslam, & Ruscio, 2006), but it also has specific consequences for consideration of the potential relation between psychopathy and sexual aggression. If psychopathy is on the one hand categorical, then individuals identified as such are members of a group or taxon, who differ naturally in kind from nonpsychopathic individuals. On the other hand, if psychopathy is distributed as a dimension, high-psychopathic individuals differ from other individuals in degree rather than in kind—residing at the high end of a continuum of psychopathic behaviors and characteristics along which individuals are positioned at varying levels.

Although some have presented evidence for the taxonicity of psychopathy, or more specifically for the taxonicity of the Impulsive–Antisocial features of its manifestation (e.g., Harris, Rice, Hilton, Lalumière, & Quinsey, 2007), the studies reporting these taxonic results (e.g., Harris et al., 2007; Harris, Rice, & Quinsey, 1994; Skilling, Harris, Rice, & Quinsey, 2002; Vasey, Kotov, Frick, & Loney, 2005), most of which come from a single laboratory, have been criticized for methodological reasons (Guay, Ruscio, Knight, & Hare, 2007; Murrie et al., 2007; Walters, Marcus, Edens, Knight, & Sanford, 2011). Studies that have avoided these methodological problems have consistently found that psychopathy, whether defined using the PCL-R or self-report measures, is distributed as a dimension (Edens, Marcus, Lilienfeld, & Poythress, 2006; Guay & Knight, 2003; Guay et al., 2007; Marcus, John, & Edens, 2004; Marcus, Lilienfeld, Edens, & Poythress, 2006; Murrie et al., 2007; Walters, Brinkley, Magaletta, & Diamond, 2008; Walters, Duncan, & Mitchell-Perez; 2007; Walters, Gray, et al., 2007; Walters et al., 2011). Consistent with this evidence, a recent study that used structural brain indicators of psychopathic tendencies also found psychopathy to be distributed as a dimension (Walters, Ermer, Knight, & Kiehl, 2015).

The dimensionality of psychopathy, or at least the dimensionality of the ways in which it has been measured to date, provides additional congruent explanatory support for its relation to sexual aggression. If psychopathy were a taxon, and sexually coercive behavior were merely an associated feature of membership in this taxon, one might expect to find a different explanatory mechanism for sexually coercive behavior among individuals in the taxon compared to those outside it. As we see in a subsequent section, however, the traits of psychopathy predict sexual coercion equally well within offender and nonoffender samples, suggesting covariation between the two across a continuum of psychopathic tendencies spanning both populations-and indicating that the high cutoffs purportedly required for categorization of individuals as psychopathic are not required for increased proclivities toward sexual coerciveness.

# The Pervasiveness, Taxonomic Role, and Predictive Validity of Psychopathy among Rapists

# The Pervasiveness of Psychopathy and Antisocial Personality among Rapists

Knight and Guay (2006) reviewed the early literature pertaining to offenders convicted of rape and documented (1) the high prevalence in this literature of the diagnosis of antisocial personality among sex offenders (e.g., Henn, Herjanic, & Vanderpearl, 1976; Prentky & Knight, 1991; Rada, 1978), (2) the consistent finding of high Minnesota Multiphasic Personality Inventory (MMPI) Psychopathic Deviate (Pd) scores among offenders convicted of rape (e.g., Anderson, Kunce, & Rich, 1979; Armentrout & Hauer, 1978; Kalichman, Szymanowski, McKee, Taylor, & Craig, 1989; Persons & Marks, 1971; Rader, 1977), and (3) the overrepresentation of individuals high on the PCL-R among rapists (e.g., Brown & Forth, 1997; Prentky & Knight, 1991; Serin, Mailloux, & Malcolm, 2001).

During the previous decade the evidence for increased levels of psychopathy among sex offenders, especially rapists, continued to mount. Olver and Wong (2006) found that rapists and mixed-victimage sex offenders had higher scores on the PCL-R as a whole and its Impulsive-Antisocial factor than child molesters and incest offenders, but not higher scores on the PCL-R Affective-Interpersonal factor. In a general sample of incarcerated sex offenders, Knight (2008) replicated Olver and Wong's (2006) results. In another sample of offenders, who were either civilly committed or had been selected for commitment but not found to be sexually dangerous, Knight (2008) found that rapists scored significantly higher than child molesters on all four PCL-R facets.

Another line of criminological research has also provided support for the hypothesis that antisociality is important in sexual offending in general, and in rapists in particular. This research has focused on the question of whether sexual offending is specialized or versatile. "Specialization" is the proclivity of an offender to commit either the same offense or an offense within the same "offense cluster" on different occasions (Blumstein, Cohen, Roth, & Visher, 1986), whereas versatility is the tendency to diversify and commit crimes in a variety of offense clusters. Examining the criminal records of 506 sex offenders being evaluated for sexual commitment, Harris, Smallbone, Dennison, and Knight (2009) found that sex offenders as a whole were versatile (criminal generalists), regardless of whether they were committed or determined not to be sexually dangerous and released back to prison to complete their sentences. Indeed, evidence for specialization was found only in the child molester subgroup. In a follow-up recidivism study using this same sample, Harris, Knight, Smallbone, and Dennison, (2011) determined that there were no differences between sex offender subgroups in their likelihood of committing sexual offenses subsequent to release. Rapists were more likely than child molesters to reoffend at all and to reoffend violently, but neither group evidenced specialization in postrelease criminal behavior. These findings replicated prior research suggesting that the commission of rape can be characterized as part of a broader general propensity to act in an antisocial manner (Lussier, LeBlanc, & Proulx, 2005; Smallbone, Wheaton, & Hourigan, 2003). Likewise, the versatility of offense behavior found among rapists in these studies is consistent with the hypothesis that antisocial tendencies are pervasive among convicted rapists.

# The Role of Psychopathy in Rapist Typologies and Etiological Models

The previously noted findings demonstrating a high prevalence of psychopathy and psychopathy-related traits in individuals convicted of rape are consistent with the typological speculation about rapists. In their review of the literature on sexual offender typologies through the mid-1980s, Knight, Rosenberg, and Schneider (1985) noted the consistent description of a specific rapist type for whom the defining characteristic was an antisocial lifestyle, with rape being only one of a large variety of antisocial behaviors. These historic accounts served as an important point of departure for the Massachusetts Treatment Center's rapist typology (MTC:R; Knight, 2010; Knight & Guay, 2006). Knight and Guay (2006) summarized the development and multiple revisions of the MTC:R typology in the MTC typology program. The program sought to integrate two strategies for generating typological models: (1) a rational/deductive ("top-down") strategy that incorporated and tested the most consistently described types in this early literature, and (2) an empirical/inductive ("bottom up") strategy that used cluster-analytic techniques to generate hypothetical types. It began by operationalizing and evaluating the best extant types proposed in the clinical literature, and then it worked to integrate this top-down rational approach with bottom-up cluster-analytic approaches. To date, the MTC:R typology has been revised three times, and the rapist typology that evolved from this research program remains the only rapist typology that has been subjected to substantial empirical validation. Central to the history of the multiple revisions of the typology was the increasing role that psychopathy-related traits came to play in each subsequent revision (see Knight, 2010; Knight & Guay, 2006). The most recent version, MTC:R4 (Knight, 2010), has developed into a modified circumplex model in which the callous-manipulative and impulsive-antisocial features of psychopathy join with hypersexuality to form core defining dimensions of the typology.

The MTC:R4 model is noteworthy not only because of the explicit role assigned to the subdimensions of psychopathy but also because this model has been shown to be congruent with an empirically validated etiological model (described in detail elsewhere; see Knight & Sims-Knight, 2011) that was developed on very different samples (community and general criminal samples rather than civilly committed rapists), using different data sources (self-report measures rather than archival ratings) and different analytic techniques (structural equation modeling as opposed to cluster-analytic and rational typology testing; Knight & Sims-Knight, 2016). Both the typological and etiological models converge on the same three core traits (sexualization, callousness-manipulativeness, and impulsive-antisocial) as central to their structures.

It is important to emphasize that the converging lines of evidence for these congruent models emerged from and were constrained by empirical investigations using different data sources and alternative analytic methods, providing substantial construct validation for their role in rape. It should not be surprising that the same core traits found to be central for etiological-mechanistic and phenotypic-descriptive differentiation have also proven important for the prediction of recidivism. As we discuss in the next section, traits related to psychopathy not only account for a considerable proportion of the variance in factors identified as predictors of general criminal recidivism (Gendreau, Goggin, & Paparozzi, 1996), but they and various manifestations of sexualization also combine to predict recidivism for subsequent sexual crimes in adults (Hanson & Bussière, 1998; Hanson & Morton-Bourgon, 2004; Knight & Thornton, 2007), and they play prominent roles in the risk assessment scales that have been fashioned to predict recidivism in both adults (e.g., Thornton & Knight, 2015) and juveniles (e.g., Knight, Ronis, & Zakireh, 2009).

# Psychopathy and Risk Assessment for Sexual Coercion

Knight and Guay (2006) concluded in their review that just as the PCL-R had consistently been found to predict subsequent general offending and violent behavior among offenders in general, it also did so in both adult and juvenile sexual offender samples. The role of the PCL-R in predicting sexual offense recidivism was less consistent. When the PCL-R showed associations with recidivism, it was the Impulsive–Antisocial factor that most often tended to be predictive, rather than the Affective–Interpersonal features. There was also evidence that the inclusion of assessments of deviant sexual arousal along with psychopathy scores increased the ability to predict sexual recidivism in both juveniles and adults. Knight and Guay cautioned, however, that available studies did not differentiate between rapists and child molesters, and that the predictive potency might differ for the two subtypes of sex offenders.

Studies over the last decade have continued to find the PCL-R to be among the top predictors of recidivism for criminal offenders in general (e.g., Leistico, Salekin, DeCoster, & Rogers, 2008), although its predictive utility appears to be lower than that of instruments designed specifically to measure particular outcomes in specific populations (e.g., violent outcome in juveniles), and it apparently works best for white, older males (Singh, Grann, & Fazel, 2011). Moreover, Walters, Knight, Grann, and Dahle (2008) have shown through analyses of data from six separate samples that the Antisocial facet accounts for much of the predictive potency of the PCL-R. Consistent with this, Coid and colleagues (2011) found that three of four PCL-R items selected as effective predictors of violent recidivism by forward and backward regression were from the Antisocial facet of the PCL-R, with the fourth item coming from the Impulsive Lifestyle facet. Indeed, in several studies (e.g., Douglas, Yeomans, & Boer, 2005; Ho, Thomson, & Darjee, 2010) the Impulsive–Antisocial factor of the PCL-R (Factor 2) has consistently predicted criminal and violent offense outcome better than the Affective-Interpersonal factor (Factor 1), and in a meta-analysis of violent recidivism, Kennealy, Skeem, Walters, and Camp (2010) found that Factor 2 was a better predictor of violent recidivism than either Factor 1 or the interaction between the two PCL-R factors.

In contrast, the predictive power of the PCL-R for sexual recidivism specifically has continued to remain inconsistent (cf. Dietrich, Smiley, & Frederick, 2007; Urbaniok, Endrass, Rossegger, & Noll, 2007). In a recent meta-analysis Hawes, Boccaccini, and Murrie (2013) identified one of the reasons for this inconsistency: Predictions in studies that used research ratings of the PCL-R (e.g., Urbaniok et al., 2007) were found superior to those that used available clinical and forensic ratings (e.g., Dietrich et al., 2007). Indeed, a study by Murrie, Boccaccini, Caperton, and Rufino (2012) that directly examined the predictive validity of PCL-R ratings in assessments in sexually violent persons' civil commitment found little evidence for the predictive power of the PCL-R in forensic practice. As with the prediction of nonsexual recidivism, the prediction of sexual recidivism has been found to be stronger for Factor 2 (and Facet 4, in particular) scores than for other factor or facet scores (Hawes et al., 2013). Kim, Guay, and Knight (2008) found that all four PCL-R facets predicted sexual recidivism among rapists during the first 5 years following their release, but none of the facets even approached significance for child molesters across the same follow-up period. In further analyses of data from this study, Parent, Guay, and Knight (2011) found that the PCL-R total score was among the best predictors of sexual recidivism at 5 years postrelease for rapists, but only barely reached significance for child molesters, among whom empirically generated actuarials were superior. These two sets of analyses provide support for Knight and Guay's caution about the need to consider subtypes in research on sex offenders, and indicate that the predictive potency of sexual recidivism will vary as function of the representation of differing subtypes in the sample (e.g., rapists vs. child molesters).

Although psychopathy-related traits have only weak power by themselves to predict sexual recidivism, prediction has been found to improve when psychopathy scores have been combined with other predictors, especially various aspects of sexualization (e.g., Hawes et al., 2013; Olver & Wong, 2006). Consequently, psychopathy-related subdimensions have maintained a consistent presence in new actuarial systems designed to predict sexual recidivism (e.g., STABLE-2007: Hanson, Harris, Scott, & Helmus, 2007; Violence Risk Scale—Sexual Offender version [VRS-SO]: Olver, Christofferson, Grace, & Wong, 2014; Olver, Wong, Nicholaichuk, & Gordon, 2007). Indeed, factor analyses of popular actuarials have consistently yielded a general criminality or antisocial factor (Brouillette-Alarie, Babchishin, Hanson, & Helmus, 2016; Olver, Klepfisz, Stockdale, Kingston, Nicholaichuk, & Wong, 2016; Olver, Neumann, Kingston, Nicholaichuk, & Wong, 2016). Moreover, recent theories about the prediction of recidivism in sexual offenders that have sought to integrate known and potential predictors into causal models have identified components of psychopathy and antisociality as critical to this endeavor (Brouillette-Alarie, Hanson, Babchishin, & Benbouriche, 2014; Mann, Hanson, & Thornton, 2010). Variables reflecting Factor 2 ImpulsiveAntisocial tendencies (e.g., lifestyle impulsiveness, resistance to rules and supervision, grievance/hostility, dysfunctional coping, externalized coping) and others reflecting Factor 1 Affective-Interpersonal features (e.g., lack of concern for others [callousness], Machiavellianism) have been identified as prime candidates for inclusion in new predictive instruments. An initial effort to apply this theoretical orientation that directly incorporated the facets of the PCL-R yielded predictive evidence to support the viability of this approach (Thornton & Knight, 2015). Related to this, Mann and colleagues (2010) speculated that clusterings of recidivism predictors reflecting psychopathic tendencies might constitute causal components of sexual aggression, which they termed "propensities." The correspondence of the clusters they identified with the core components of the MTC:R4 typology and with the causal modeling described in the next section, provide additional support for the validity of this hypothesis.

# The Psychometric Correlates of Rape in Noncriminal Samples

Knight and Guay (2006) documented the history of the role of both psychopathy and psychopathyrelated subdimensions in the generation of etiological models of sexually coercive behavior against women in nonoffender samples. Although the earliest studies in this area implicated aspects of psychopathy as important traits in predicting rape (Koss & Dinero, 1988; Rappaport & Burkhart, 1984), researchers studying nonoffender samples (e.g., Malamuth, 1986) focused instead on sexualaggression-congruent attitudes and behaviors that had yielded slightly higher associations with selfidentified sexually coercive behavior in noncriminal samples. For example, Malamuth, Sockloskie, Koss, and Tanaka (1991) postulated that sexual aggression by men toward women arises through two intersecting pathways, consisting of poweroriented (hypermasculine) attitudes and sexually promiscuous tendencies. These concurrent correlates of sexual coercion appeared to provide greater explanatory potential for rape than measures of psychopathic tendencies. This led to speculation that these concurrent correlates might be more appropriate for noncriminal populations, and that different explanatory models might be needed for nonoffenders than for offenders (Malamuth et al., 1991; Malamuth, Linz, Heavey, Barnes, & Acker, 1995).

Attempts by Knight (1993) and his collaborators to replicate Malamuth and colleagues' (1991) two-path confluence model revealed, however, a disappointingly low percentage of the variance in sexual coercion explained by predictors of this type in both college students and offenders. They found that the substitution of a Callous-Manipulative latent trait for Hypermasculinity and the introduction of an Antisocial latent trait path both increased predictive power (Holmes & Knight, 1994; Johnson & Knight, 1998; Knight, 1995; Knight & Sims-Knight, 1999) and served to reestablish psychopathy-related subdimensions as important latent traits in the etiological modeling of sexually coercive behavior. This three-path model (i.e., callous-manipulative traits, antisocial tendencies, and hypersexuality) has been replicated in criminal and noncriminal samples of both adolescents and adults (Knight & Sims-Knight, 2003, 2004), has served as a theoretical guide to our research program (Knight & Sims-Knight, 2011), and has provided the basis for the integration of our etiological and typological models (Knight & Sims-Knight, 2016). In recent presentations of his confluence model, Malamuth (2003; Malamuth & Hald, 2016) acknowledges the importance of psychopathy and antisociality in his model.

Since publication of the original version of this chapter in 2006, substantial new work on nonoffender samples has provided further evidence for the importance of the subdimensions of psychopathy in predicting sexually coercive behavior. The ready availability of well-validated self-report inventories for assessing the subdimensions of psychopathy (e.g., PPI, Self-Report Psychopathy scale [SRP-III], SRP short form [SRP-SF], MIDSA) has facilitated exploration of the contributions of psychopathic tendencies to sexual aggression in college and community samples. The most frequently used measure of psychopathy in work of this type has been the PCL-R's questionnaire counterpart, the SRP (Paulhus, Neumann, Hare, Williams, & Hemphill, 2016) or the SRP-SF-either administered alone to assess psychopathy specifically, or in conjunction with measures of Narcissism and/or Machiavellianism to measure the so-called "Dark Triad" (Paulhus & Williams, 2002).

In a study of 88 college students examining how traits of the Dark Triad relate to sexual fantasies and sexual coercion, Williams, Cooper, Howell, Yuille, and Paulhus (2009) found significant associations for both narcissism as indexed by the Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979) and psychopathy, as assessed by the SRP-SF, with sexually coercive behavior. Evaluation of these two variables together in a regression model revealed, however, that the association of narcissism with deviant sexual behavior (bondage, sadism, sexual assault) vanished after accounting for its covariation with psychopathy. Moreover, psychopathy moderated the relation between use of pornography and the proclivity to aggress sexually, such that pornography use was associated with deviant sexual behavior scores *only* for those participants who scored high in psychopathy.

In a study of a sample of 470 single young men from the general community, Abbey, Jacques-Tiura, and LeBreton (2011) examined the relation between distinct components of psychopathy as indexed by the SRP-III (Interpersonal Manipulation, Callous Affect, Erratic Lifestyle, and Antisocial Behavior) and sexually aggressive behavior. They also administered the NPI and examined associations for its Exploitative and Entitlement scales specifically. All four SRP-III scales and both NPI scales correlated significantly with sexually aggressive behavior. In another sample of 447 adult community men, Jones and Olderbak (2014) examined relations between traits of the Dark Triad and self-reported intentions to engage in sexual coaxing or coercion in various hypothetical situations. Whereas all three Dark Triad traits covaried with coaxing across all situations, only psychopathy (as indexed by the SRP-SF) covaried with coercion across all situations.

Mouilso and Calhoun (2012) found that both psychopathy, as indexed by the SRP-III, and narcissism as measured by the Narcissistic Personality Disorder subscale of the Structured Clinical Interview for DSM Axis II Disorders (SCID-II; First, Gibbon, Spitzer, Williams, & Benjamin, 1997) were related to perpetration of sexual aggression. In a second study of college males (Mouilso & Calhoun, 2013), sexual perpetrators differed from nonperpetrators on three of the four subscales of the SRP-III (Interpersonal Manipulation, Erratic Lifestyle, and Antisocial Behavior). The Illinois Rape Myth Acceptance Scale (Payne, Lonsway, & Fitzgerald, 1999) also predicted sexual perpetration in this study but did not account for additional variance beyond the psychopathy measures. In another study that examined predictive relations of the SRP-III subscales with dating violence and sexual coercion in 132 college males, Lord (2012) found that the Interpersonal Manipulation, Erratic Lifestyle, and Antisocial Behavior scales predicted dating violence to similar degrees, but the Erratic Lifestyle scale predicted sexual coercion most strongly.

Investigations using other measures have also yielded evidence for covariation between psychopathy and sexually coercive behavior in noncriminals. In a sample of 1,737 men selected randomly from the general population of South Africa, those who self-identified as having been sexually coercive scored significantly higher than noncoercive males on the Blame Externalization and Machiavellian Egocentricity scales of the PPI (Jewkes, Sikweyiya, Morrell, & Dunkle, 2011). Using data from the National Longitudinal Study of Adolescent Health, Casey, Beadnell, and Lindhorst (2009) found that adolescent delinquent behavior significantly predicted sexually coercive behavior and also mediated an observed relation between physical abuse in childhood and later sexual coercion. Muñoz, Khan, and Cordwell (2010) found that for both male and female university students. higher scores on primary psychopathy as indexed by Levenson, Kiehl, and Fitzpatrick's (1995) SRP scale-reflecting callous, selfish, and manipulative tendencies-predicted more frequent use of all strategies of sexual coercion that were assessed. Using scales from the MIDSA (described earlier), Harris and Sims-Knight (2017) found that scores on antisocial behavior scales covaried with sexually coercive behavior in both male and female college students. In contrast, in a study of a representative sample of college males Lyndon, White, and Kadlec (2007) did not find a relation between sexually coercive behavior and antisocial tendencies as indexed by an adaptation of Elliott and Ageton's (1980) delinquency measure, which asks respondents to report how frequently in the past year they have engaged in 11 specific delinquent behaviors. Lyndon and colleagues did not assess other aspects of psychopathy.

In summary, with the exception of Lyndon and colleagues (2007), multiple studies, using a variety of different populations and administering a range of different self-report measures, have consistently documented associations for both psychopathy and antisociality with sexually coercive behavior.

# The Role of Psychopathy in New Developments in Etiological Modeling

Two recent developments in research on our etiological model of rape have influenced our perspective about the relation between psychopathy and sexual aggression. First, in our recent structural equation modeling (SEM) studies of civilly committed sexual offenders, observed levels of covariation between two latent traits-Callous/Manipulativeness (CM, defined primarily by Conning, Superficial Charm [Machiavellianism] and Impulsivity scales of the MIDSA) and Hypersexuality (defined by the Sexual Compulsivity, Sexual Preoccupation, and Hypersexuality [high sex drive] scales of the MIDSA)-were so high that modification indices indicated that the fit of our model of these and other pertinent variables would be increased substantially if we combined the two into a single latent trait (Knight, 2013; Sims-Knight & Knight, 2013). New analyses of data from samples of male and female college students have replicated the high covariation between these two traits in noncriminals (Graham & Knight, 2017). In another study, we correlated the components of hypersexuality with the PCL-R facets, and consistent with the Machiavellian component of the MIDSA CM trait, only the Interpersonal facet emerged as a significant correlate (Knight, 2012). The continued high covariation between these traits across different populations and measurement methods has led to speculation about what mechanisms might mediate this relation.

Second, studies exploring the relation between psychopathy and sexual sadism have corroborated a consistent association between the two (Mokros, Osterheider, Hucker, & Nitschke, 2011; Robertson & Knight, 2014). In addition, data from our laboratory suggest that the traditional conceptualization of sadism as encompassing only extremely aggressive behaviors may be incorrect, and that sadism may better be conceptualized as the extreme end of what we have called an agonistic continuum (Knight, 2010; Knight, Sims-Knight, & Guay, 2013). The relation between psychopathy and this revised concept of sadism also raises questions about potential shared mechanisms underlying the two. We discuss each of these issues in turn.

#### Covariation of Callous/Manipulativeness and Hypersexuality

From the beginning of our attempts to formulate SEMs using MIDSA scales to predict sexual aggression against women, modification indices suggested a link between the two latent traits of CM and Hypersexuality that we had not initially predicted (Johnson & Knight, 1998; Knight & Sims-Knight, 1999). In every sample we have tested since these initial studies, this covariation has been significant and substantial (Graham & Knight, 2017; Knight & Sims-Knight, 2003, 2004, 2011), and in some instances SEM models have shown better fit when the two were combined into a single latent trait (Knight, 2013; Knight & Sims-Knight, 2013).

Using a variety of measures to assess psychopathy and its subdimensions, other laboratories have documented links between psychopathy and various aspects of sexual behavior and fantasy, further corroborating the relation between the two. In a sample of male sex offenders, Harris and colleagues (2007) found that scores on both the Affective-Interpersonal factor and the Impulsive-Antisocial factor of the PCL-R correlated with a juvenile Coercive and Precocious Sexuality factor. Interestingly, in their preliminary exploratory factor analysis (see Table 3, p. 12) the only PCL-R item with a secondary loading greater than .40 on their Sexuality factor was the PCL-R Conning/ Manipulative item. Using the SRP-III to assess psychopathy in an undergraduate sample, Visser, Pozzebon, Bogaert, and Ashton (2010) found that for males, both the Affective-Interpersonal and Impulsive–Antisocial factors covaried with sexual behavior, but for females, only the latter did (with the exception of items pertaining to "oral sex" and "yearly affairs," which correlated with Factor 1 for females). Using MMPI-2-RF analogue scales (Ben-Porath & Tellegen, 2008) to assess the PPI factors in undergraduates, Kastner and Sellbom (2012) found that the Self-Centered Impulsivity (ScI) factor was associated significantly more strongly with most measures of sexual behavior than was the Fearless Dominance factor. In a sample of single men from the community LeBreton, Baysinger, Abbey, and Jacques-Tiura (2013) found that SRP-III psychopathy facets of Callous Affect, Interpersonal Manipulation, and Erratic Lifestyle (Williams, Paulhus, & Hare, 2007) and NPI narcissism scales of Entitlement and Exploitation (Raskin & Terry, 1988) both covaried significantly with scales measuring impersonal sex attitudes and sexual dominance, and that all but the SRP-III Callous Affect scale covaried with impersonal sexual behavior.

Finally, several studies have linked various measures of the Dark Triad traits (subclinical narcissism, Machiavellianism, and psychopathy; Paulhus & Williams, 2002) with a variety of measures of sexual behavior and fantasy. In a study of undergraduate students Jonason, Li, Webster, and Schmitt (2009) showed that the scores on the Dark Triad traits were positively related to having more sex partners, unrestricted sociosexuality, and a greater preference for short-term mates. In another study of college students, Baughman, Jonason, Veselka, and Vernon (2014) found that all three Dark Triad scales were related to sexual drive, with psychopathy showing the strongest relation. Testing an online sample recruited by a marketing company, Carter, Campbell, and Muncer (2014) found that scores on the Dark Triad correlated positively with both recreational sexual behavior and sexual desire for others for both males and females.

In summary, these studies corroborate the hypothesis that the personality characteristics of psychopathy, especially its Machiavellian, callous, narcissistic, and impulsive components, appear to show consistent covariations with measures of sexual behaviors and beliefs that is consistent across different assessment tools and populations.

The CM trait in our SEM modeling analyses has generally been indexed using three to four scales from the MIDSA: Conning-Superficial Charm, Impulsivity, Hostility toward Women, and in some cases Lack of Perspective Taking (see MIDSA, 2011, for scale descriptions). Although this cluster of scales does not correspond clearly to any one of the PCL-R facets, an analysis of the item content of these scales suggests that as a whole they cover something akin to the PPI-ScI factor, which encompasses subscales of Machiavellian Egocentricity, Impulsive Nonconformity, and Blame Externalization (Neumann, Malterer, & Newman, 2008; Witt, Donnellan, Blonigen, & Patrick, 2011) and in some analyses the Carefree Nonplanfulness scale (Benning, Patrick, Hicks, Blonigen, & Krueger, 2003). The two most stable indicators of the MIDSA CM factor across samples have been the Conning-Superficial Charm scale and the Impulsivity scale. The former corresponds best to the PPI Machiavellian Egocentricity scale, and the latter, which captures acting without thinking, overlaps with both the PPI Impulsive Nonconformity (marching to one's own desires rather than society's or others') and Carefree Nonplanfulness (not thinking about consequences or long-term goals) scales. Also loading on the CM latent trait in some analyses is the MIDSA Lack of Perspective Taking scale, which combines items reflecting failure to take another's perspective (like certain items of the PPI Machiavellian Egocentricity scale) with items capturing a failure to consider consequences of behaviors prior to acting (akin to several items in the PPI Carefree Nonplanfulness scale). The MIDSA Hostility Toward Women scale, which includes items involving negative blaming of women for one's behavior toward them, also loads onto the CM trait and corresponds to a narrower version of the PPI Blame Externalization scale, focused specifically on women. In a study of 487 undergraduates, Knight and Graham (2015) found for both males and females that analogue PPI Machiavellian and Impulsivity scales correlated significantly with the MIDSA Conning–Superficial Charm and Impulsivity scales, respectively, providing empirical support for the hypothesized association between the PPI ScI and the MIDSA CM.

The core, unifying thread that runs through both PPI-ScI and MIDSA-CM factors appears to be an overfocus by the respondent on primary immediate goals and rewards and a disregard for secondary (i.e., non-goal-related) information, whether that information originates from (1) another's needs or opinions (Machiavellianism and Lack of Perspective Taking), (2) negative immediate or long-term consequences (Carefree Nonplanfulness), or (3) societal rules and expectations as opposed to the respondent's own needs (Impulsive Nonconformity). Blame Externalization and Hostility toward Women could fit into this conceptualization as secondary rationalizations that follow when one acts in an entitled and irresponsible manner, and others respond in predictable negative ways. This tendency to project blame can be interpreted as a reassertion of the offender's primary needs and the denigration, devaluation, or faultfinding of the other's motivations.

This overfocus on reward is descriptively congruent with Newman's (Hamilton & Newman, Chapter 4, this volume; Newman & Baskin-Sommers, 2011) hypothesis that a response modulation deficit plays a central role in psychopathy. This theory proposes that the core deficit underlying psychopathy is an attentional deficit that is characterized by a difficulty keeping an adaptive balance between top-down and bottom-up processing. When psychopathic individuals have a top-down primary focus, they are inefficient at processing inconsistent bottom-up information. This cognitive deficit is distinguishable from executive function deficits that are related to antisocial behavior. It appears to involve an earlier rather than a later cognitive processing deficiency (Newman & Baskin-Sommers, 2011) and is most apparent when a goal-directed focus has been established and is ongoing (Baskin-Sommers, Curtin, & Newman, 2011). Establishing a primary goal engages the behavioral activation system (BAS), which is theorized to be related to activation of the dopaminergic mesolimbic reward system and is associated with both heightened approach motivation and a narrowing of attentional focus toward the primary reward (e.g., Corr, 2008; Gable & Harmon-Jones, 2008; Gray & McNaughton, 2000).

One could generate developmental/behavioral hypotheses to account for the strong, consistent

covariation between scores on the CM factor and measures of sexual behavior and fantasy. The most tenable of such hypotheses focuses on CM as the more primary causal trait. The lack of emotional attachment, and proneness to use charm, flattery, and outright lying as manipulative tools to gain sexual favors, may encourage greater sexual activity in general, more sexual encounters of an impersonal nature, and consequently greater overall preoccupation with sexualization (e.g., Muñoz et al., 2010). The emotional detachment of individuals scoring high on CM may also lead them to substitute sexual satisfaction for intimacy needs, so that higher sexualization compensates for unmet needs for social connectedness (e.g., Cortoni & Marshall, 2001). By contrast, causal hypotheses in the opposing direction (i.e., of CM tendencies arising from hypersexuality) are much less compelling. In any case, however, purely behavioral hypotheses do not seem sufficient to account for the consistency of the covariation between CM and hypersexuality across criminal and noncriminal, juvenile and adult, and male and female samples.

More compelling are potential biological and neurological hypotheses. For example, in a neuroimaging study of adult community participants, Buckholtz and colleagues (2010) found that high PPI-ScI predicted excessive dopamine (DA) recruitment in mesolimbic reward regions of the brain (e.g., nigra/ventral tegmental area, ventral striatum [VS]) in response to behaviorally relevant environmental reinforcers. Bjork, Chen, and Hommer (2012) reported a similar positive correlation between overall PPI scores and VS recruitment during anticipation of instrumental rewards. This finding of increased reward system activation in high self-centered, impulsive-psychopathic individuals could be due either to heightened activity in midbrain DA neurons or decreased nucleus accumbens (nAcc) dopaminergic function emanating from a more extensive failure of inhibitory mechanisms (see Patrick, Foell, Venables, & Worthy, 2016). The nAcc and anterior cingulate cortex (ACC) have been conceptualized as "nodes" of a corticostriatal circuit involved in stimulus-reward learning (e.g., Galvan et al., 2005), and the ACC along with the VS and insula have been shown to manifest both structural (e.g., Boccardi et al., 2013; Cope et al., 2012; Ly et al., 2012) and functional deficiencies in psychopathy (e.g., Birbaumer et al., 2005; Kiehl et al., 2001; Veit et al., 2002). Sexual motivation appears to share common neurocircuitry. Stoléru, Fonteille, Cornélis, Joyal, and Moulier (2012) formulated a four-component neurophenomenological model of sexual motivation in which the ACC, claustrum, posterior parietal cortex, hypothalamus, substantia nigra, and VS are neural correlates of the motivational component of sexual arousal. They hypothesized that this motivational component directs behavior to a sexual goal, urging the expression of overt sexual behavior. Consequently, this network of brain regions could constitute shared neural circuitry for both CM–ScI and sexual motivation, and as such may account for their high behavioral covariation. Interestingly, these same areas are also implicated in emotional and moral processing (e.g., Glenn & Raine, 2009).

This reward and sexual motivational circuitry overlaps with what Steinberg (2008) has termed the "socio-emotional system," which comprises the amygdala, nAcc, orbitofrontal cortex, medial prefrontal cortex, and superior temporal sulcus. Activation in this system overlaps with activity in regions sensitive to changes in reward magnitude including VS and medial prefrontal areas (e.g., Galvan et al., 2005; Nelson, Leibenluft, Mc-Clure, & Pine, 2005). Steinberg (2008) differentiates this motivational aspect of impulsivity from the cognitive control system (e.g., the dorsolateral prefrontal cortex, anterior and posterior cingulate, and temporoparietal cortices), which is considered critical to the coordination of affect and cognition, and for emotion regulation. He argues that these two systems follow different developmental trajectories, and it is the confluence of enhanced reward sensitivity and weak cognitive control that leads to the high risk taking and sensation seeking evident in adolescence, and to the well-known age-crime curve pattern (Hirschi & Gottfredson, 1983). In addition, Steinberg's model overlaps with Burt's (2012, 2013) distinction between nonaggressive rule-breaking antisocial behavior and physical aggression, which she argues may also be distinguished by their developmental trajectories, and by their genetic etiologies and covariates.

Recent research has also provided evidence for distinct neurological response patterns in individuals exhibiting the core affective-interpersonal features of psychopathy as compared to those high in antisocial behavior per se. Antisocial individuals score high on Negative Emotionality (NEM) and exhibit increased amygdala reactivity to fear cues, whereas psychopathic individuals tend to be low on both (Blair, 2010; Hyde, Byrd, Votruba-Drzal, Hariri, & Manuck, 2014). The pattern for antisocial individuals is consistent with the circuitry of reactive aggression (i.e., overactivity in threat-processing regions and reduced activation in frontal cortical regions such as the medial, orbital, and inferior), whereas the pattern of reduced threat response and reduced amygdala responding is more consistent with instrumental aggression (Blair, 2010; Glenn & Raine, 2014). Of note, hypoamygdala functioning has been related to hypersexuality, albeit with some inconsistency (Stoléru et al., 2012).

Taken together, these data suggest that there are distinguishable variants of impulsivity, one involving risk taking, reward-oriented sensation seeking, and disregard for secondary information in goal contexts, and the other marked by increased sensitivity to threat cues, affective dysregulation, and impaired behavioral control under conditions of negative activation. Both Hypersexuality and CM/ ScI appear to covary more with the former type. Distinguishing between these different variants of impulsivity is likely to be essential for discriminating between psychopathy-related and other forms of aggression. From this perspective, the emphasis of the triarchic psychopathy model (Patrick & Drislane, 2015; Patrick, Fowles, & Krueger, 2009) on separating a constituent dimension of impulsive dyscontrol (disinhibition) from dimensions of callousness-unemotionality (meanness) and fearless dominance (boldness), and of deconstructing the PPI-ScI factor by using Impulsive Nonconformity and Carefree Nonplanfulness as indicators of disinhibition and Machiavellian Egocentricity (along with Coldheartedness) to index meanness (Hall et al., 2014), seems problematic. In our view combining nonconforming and nonplanful types of impulsivity under the rubric of "disinhibition," and assigning callous-exploitative tendencies (as indexed by PPI Machiavellian Egocentricity) to the construct of meanness, masks rather than disambiguates these distinct types.

#### Sadism: Reconceptualization and Relation to Psychopathy

Although clinicians have hypothesized a systematic relation between sexual sadism and the subdimensions of psychopathy since they first attempted to describe the characteristics of the sadistic sexual offender, careful empirical scrutiny of this hypothesis has emerged only recently (Kirsch & Becker, 2007; Mokros et al., 2011; Robertson & Knight, 2014). The first descriptive typological models for rapists differentiated between aggressive offenders with and without sadism (e.g., "Displaced Anger or Anger-Retaliation" types vs. "Sadistic or Anger-Excitation" types; see Knight et al., 1985). In these descriptive models the sadistic types were invariably described as manipulative, impulsive, lacking in victim empathy, and as presenting with unstable interpersonal relationships and histories of nonsexual offenses (Knight et al., 1985). From this point forward, sadism and psychopathy were viewed as sharing descriptive characteristics, including an apparent emotional detachment from the suffering of others (e.g., Blair, 2007; Meloy, 1997), a willingness to inflict harm or pain on another to achieve one's own ends (e.g., Woodworth & Porter, 2002), a desire to control and dominate their victims (Meloy, 1997), entitlement to do as they please with those whom they dehumanized and victimized (Meloy, 1997), and a lack of remorse about the suffering they inflict on others (Brittain, 1970; Meloy, 2000).

In our laboratory both the iterative, empirically driven revisions of the MTC rape typologies (Knight, 2010) and the generation of a SEM for the etiology of sexually coercive behavior against women (Knight & Sims-Knight, 2016) have yielded evidence across multiple samples for a covariation between facets of psychopathy and sadism in both archival ratings and self-report measures. Indeed, in two recent SEM analyses with different sex offender samples, in which the latent traits of CM and Hypersexuality were merged to maximize model fit, the combined CM/Hypersexual trait showed substantial covariation with Sadistic fantasies (Knight, 2013; Sims-Knight, 2013). In one model, the Externalizing latent trait also covaried with these fantasies (Knight, 2013), but this covariation was not replicated in the second sample (Sims-Knight, 2013). Other investigations prior to 2006 had also found a covariation between psychopathy and sadism (e.g., Barbaree, Seto, Serin, Amos, & Preston, 1994; Gretton, McBride, Hare, O'Shaughnessy, & Kumka, 2001; Holt, Meloy, & Strack, 1999; Porter, Woodworth, Earle, Drugge, & Boer, 2003). More recent studies that have examined the relation for psychopathy as a whole have continued to show evidence of covariation between total psychopathy scores and sadistic fantasies and paraphilias (e.g., Fischer, 2008; Hill, Habermann, Berner, & Briken, 2006; Woodworth et al., 2013).

Some other recent studies have examined associations of sadism with specific facets of psychopathy, as opposed to overall scores on the construct. In a Finnish forensic sample Häkkänen-Nyholm, Repo-Tiihonen, Lindberg, Salenius, and Weizmann-Henelius (2009) compared scores on the PCL-R for offenders with sexual homicides to scores for those who had committed nonsexual homicides. Sexual murderers scored higher on the PCL-R as a whole, with the difference attributable to increased scores on Factor 1 and its two facets (1 = Interpersonal, 2 = Affective). Mokros and colleagues (2011), using data from a sample of 100 male forensic patients, found that sadism as defined by the Severe Sexual Sadism Scale (SSSS; Nitschke, Osterheider, & Mokros, 2009) covaried significantly with both the Affective and Antisocial facets of the PCL-R. In two sexual offender samples, Robertson and Knight (2014) found that sadism, whether measured by self-report or archival ratings, covaried with both the Interpersonal and Antisocial facets of the PCL-R. The PCL-R's Affective and Impulsive Lifestyle facets were each related to sadism in one, but not the other, sample. Despite being measured using different methods, the self-report measure of sadism in this study covaried more with the archivally derived PCL-R than did the similar, archivally rated measure of sadistic tendencies. Thus, although a significant relation has consistently been found for overall PCL-R scores with sadism, associations for the individual facets of the PCL-R have varied both as a function of type of sample (i.e., general forensic, psychiatric forensic, sexual offender, civilly committed) and of the specific definition of sadism employed (sexual murder, SSSS, MTC typology, MIDSA self-report). In summary, studies that have focused on specific psychopathy facets have reported associations most consistently for the PCL-R's Interpersonal, Affective, and Antisocial facets and least consistently for its Impulsive Lifestyle facet. The strongest correlations have been apparent when self-reported sadism has been assessed.

Relevant to unpacking the covariation of the subdimensions of psychopathy with sadism are recent factor-analytic, item response theory, and taxometric investigations that provide support for a reconceptualization of sadism as the extreme high pole of an agonistic continuum that extends from no sexually coercive fantasies or behaviors at the low end, through paraphilic coercive fantasies, to fantasies of controlling, bondage, and humiliation during sex, to fantasies of hurting a victim during sex, and finally to serious sadistic fantasies and behaviors (Knight, 2010; Knight, Sims-Knight, & Guay, 2013; Mokros, Schilling, Weiss, Nitschke, & Eher, 2014). The current exploration of only the extreme upper end of this continuum might mask important relations because of partial measurement and truncation of the full range of the construct. Indeed, some data suggest that different subdimensions of psychopathy may be differentially related to varying levels of the agonistic continuum (e.g., Liu, 2014; Sims-Knight, & Guay, 2011). Consistent with our discussion of the covariation of psychopathy with sexualization, a full understanding of the relation of sadism to psychopathy may also require better differentiation between the different kinds of impulsivity discussed earlier. The covariation of sadism and the agonistic continuum with various self-report measures of sexualization and the CM trait in our SEMs (Knight, 2013; Knight & Guay, 2006; Sims-Knight, 2013) suggest that the type of impulsivity marked by risk taking, reward-sensation seeking, and disregard for non-goal-related information might be the more important correlate of the agonistic continuum and a better key to unlocking the theoretical motivating components of sadism. Alternatively, both types of impulsivity might play interacting roles in, or comprise independent paths toward, the equifinal outcome of sadistic behavior (Cicchetti & Rogosch, 1996). In our view, neither the triarchic model nor the PCL-R provides for adequate differentiation of these different variants of impulsivity.

## Conclusions

Research in the decade since the publication of our chapter in the first edition of this handbook (Knight & Guay, 2006) has continued to support the hypothesis that systematic covariation exists between psychopathy and sexual aggression. Sexual coercion continues to be cited as a characteristic of psychopathy and antisocial personality in widely used diagnostic criteria. Although sexually coercive behavior is often subsumed under the general rubric of violence in criminological studies, in studies in which it has been examined separately, it tends to be overrepresented among psychopathic offenders. Theoretical models for psychopathy and sexual aggression continue to converge on similar and sometimes synergistic explanatory constructs. Among sexually aggressive offenders, rapists consistently manifest the highest levels of psychopathy and psychopathy-related traits, and psychopathy continues to play a prominent role in etiological and typological models of rape. Moreover, psychopathy-related constructs have a prominent place in newer dynamic and static predictive instruments developed to assess sexual offense recidivism. Furthermore, the covariation between psychopathy and sexual coercion is not limited to criminal samples; it is consistently found among noncriminals as well.

Recent developments in our etiological models have focused on exploring the covariation of psychopathy with both hypersexuality and sadism, and we have speculated on the nature of the shared mechanisms that might account for these consistent phenotypic correlations. We propose an explanatory model that emphasizes differentiation between two variants of impulsivity, one involving risk taking, reward-sensation seeking, and disregard for non-goal-related information, and the other involving hypersensitivity to threat, affective dysregulation, and impaired behavioral control in contexts of high negative arousal. We argue that these types of impulsivity are not adequately differentiated in current measures of psychopathy. We are currently testing these speculations in our laboratory, using experimental paradigms in both criminal and noncriminal samples.

#### ACKNOWLEDGMENTS

Developments reported in this chapter pertaining to the etiological model of sexual aggression and the predictive validity of the facets of psychopathy and their covariation with sexualization and sadism were supported by research Grant No. 94-IJ-CX-0049 from the National Institute of Justice and by a grant from the Guggenheim Foundation.

#### REFERENCES

- Abbey, A., Jacques-Tiura, A. J., & LeBreton, J. M. (2011). Risk factors for sexual aggression in young men: An expansion of the confluence model. Aggressive Behavior, 37, 450–464.
- American Psychiatric Association. (1987). Diagnostic and statistical manual of mental disorders (3rd ed., rev.). Washington, DC: Author.
- American Psychiatric Association. (2000). *Diagnostic* and statistical manual of mental disorders (4th ed., text rev.). Washington, DC: Author.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: Author.
- Anderson, W. P., Kunce, J. T., & Rich, B. (1979). Sex offenders: Three personality types. *Journal of Clinical Psychology*, 35, 671–676.
- Armentrout, J. A., & Hauer, A. L. (1978). MMPIs of rapists of adults, rapists of children, and non-rapist sex offenders. *Journal of Clinical Psychology*, 34, 330–332.
- Barbaree, H. E., & Marshall, W. L. (1991). The role of male sexual arousal in rape: Six models. *Journal of Consulting and Clinical Psychology*, 59, 621–630.
- Barbaree, H., Seto, M. C., Serin, R. C., Amos, N. L., & Preston, D. L. (1994). Comparisons between sexual and nonsexual rapist subtypes: Sexual arousal to rape, offence precursors, and offense characteristics. *Criminal Justice and Behavior*, 21, 95–114.
- Baskin-Sommers, A. R., Curtin, J. J., & Newman, J. P. (2011). Specifying the attentional selection that moderates the fearlessness of psychopathic offenders. *Psychological Science*, 22(2), 226–234.

- Baughman, H. M., Jonason, P. K., Veselka, L., & Vernon, P. A. (2014). Four shades of sexual fantasies linked to the Dark Triad. *Personality and Individual Differences*, 67, 47–51.
- Benning, S. D., Patrick, C. J., Hicks, B. M., Blonigen, D. M., & Krueger, R. F. (2003). Factor structure of the psychopathic personality inventory: Validity and implications for clinical assessment. *Psychological As*sessment, 15, 340–350.
- Ben-Porath, Y. S., & Tellegen, A. (2008). MMPI-2-RF (Minnesota Multiphasic Personality Inventory–2): Manual for administration, scoring, and interpretation. Minneapolis: University of Minnesota Press.
- Bernat, J. A., Calhoun, K. S., & Adams, H. E. (1999). Sexually aggressive and nonaggressive men: Sexual arousal and judgments in response to acquaintance rape and consensual analogues. *Journal of Abnormal Psychology*, 108, 662–673.
- Birbaumer, N., Veit, R., Lotze, M., Erb, M., Hermann, C., Grodd, W., et al. (2005). Deficient fear conditioning in psychopathy: A functional magnetic resonance imaging study. Archives of General Psychiatry, 62, 799–805.
- Bjork, J. M., Chen, G., & Hommer, D. W. (2012). Psychopathic tendencies and mesolimbic recruitment by cues for instrumental and passively obtained rewards. *Biological Psychology*, 89, 408–415.
- Blair, R. J. R. (1995). A cognitive developmental approach to morality: Investigating the psychopath. *Cognition*, 57, 1–29.
- Blair, R. J. R. (2007). The amygdala and ventromedial prefrontal cortex in morality and psychopathy. *Trends in Cognitive Sciences*, 11(9), 387–392.
- Blair, R. J. R. (2010). Psychopathy, frustration, and reactive aggression: The role of ventromedial prefrontal cortex. British Journal of Psychology, 101, 383–399.
- Blair, R. J. R., Mitchell, G., & Blair, K. (2005). The psychopath: Emotion and the brain. Oxford, UK: Blackwell.
- Blumstein, A., Cohen, J., Roth, J., & Visher, C. (1986). Criminal careers and career criminals. Washington, DC: National Academy Press.
- Boccardi, M., Bocchetta, M., Aronen, H. J., Repo-Tiihonen, E., Vaurio, O., Thompson, P. M., et al. (2013). Atypical nucleus accumbens morphology in psychopathy: Another limbic piece in the puzzle. *International Journal of Law and Psychiatry*, 36, 157–167.
- Brittain, R. P. (1970). The sadistic murderer. Medicine, Science and the Law, 10, 198–207.
- Brouillette-Alarie, S., Babchishin, K. M., Hanson, R. K., & Helmus, L.-M. (2016). Latent constructs of the Static-99R and Static-2002R: A three-factor solution. Assessment, 23, 96–111.
- Brouillette-Alarie, S., Hanson, R. K., Babchishin, K. M., & Benbouriche, M. (2014). De la prédiction à la compréhension: Recension des dimensions psychologiques de la Statique-99 [From prediction to understanding: A literature review of the psychological dimensions of the Static-99]. Pratiques Psychologiques, 20, 1–19.

- Brown, S. L., & Forth, A. E. (1997). Psychopathy and sexual assault: Static risk factors, emotional precursors, and rapist subtypes. *Journal of Consulting and Clinical Psychology*, 65, 848–857.
- Buckholtz, J. W., Treadway, M. T., Cowan, R. L., Woodward, N. D., Benning, S. D., Li, R., et al. (2010). Mesolimbic dopamine reward system hypersensitivity in individuals with psychopathic traits. *Nature Neuroscience*, 13, 419–421.
- Burt, S. A. (2012). How do we optimally conceptualize the heterogeneity within antisocial behavior?: An argument for aggressive versus non-aggressive behavioral dimensions. *Clinical Psychology Review*, 32, 263–279.
- Burt, S. A. (2013). Do etiological influences on aggression overlap with those on rule breaking?: A metaanalysis. Psychological Medicine, 43, 1801–1812.
- Carter, G. L., Campbell, A. C., & Muncer, S. (2014). The Dark Triad: Beyond a "male" mating strategy. *Personality and Individual Differences*, 56, 159–164.
- Casey, E, A., Beadnell, B., & Lindhorst, T. P. (2009). Predictors of sexually coercive behavior in a nationally representative sample of adolescent males. *Journal of Interpersonal Violence*, 24(7), 1129–1147.
- Cicchetti, D., & Rogosch, F. A. (1996). Equifinality and multifinality in developmental psychopathology. *De*velopment and Psychopathology, 8, 597–600.
- Cleckley, H. (1988). *The mask of sanity* (5th ed.). Augusta, GA: Emily S. Cleckley private printing.
- Coid, J. W. (1992). DSM-III diagnosis in criminal psychopaths: A way forward. Criminal Behaviour and Mental Health, 2, 78–94.
- Coid, J. W., Yang, M., Ullrich, S., Zhang, T., Sizmur, S., Farrington, D., et al. (2011). Most items in structured risk assessment do not predict violence. *Journal of Forensic Psychiatry and Psychology*, 22(1), 3–21.
- Cope, L. M., Shane, M. S., Segall, J. M., Nyalakanti, P. K., Stevens, M. C., Pearlson, G. D., et al. (2012). Examining the effect of psychopathic traits on gray matter volume in a community substance abuse sample. Psychiatry Research: Neuroimaging, 204, 91–100.
- Corr, P. J. (2008). Reinforcement sensitivity theory (RST): Introduction. In P. J. Corr (Ed.), The reinforcement sensitivity theory of personality (pp. 1–44). New York: Cambridge University Press.
- Cortoni, F., & Marshall, W. L. (2001). Sex as a coping strategy and its relationship to juvenile sexual history and intimacy in sexual offenders. Sexual Abuse: A Journal of Research and Treatment, 13(1), 27–43.
- DeGue, S., DiLillo, D., & Scalora, M. (2010). Are all perpetrators alike?: Comparing risk factors for sexual coercion and aggression. Sexual Abuse: A Journal of Research and Treatment, 22, 402–426.
- Dietrich, A. M., Smiley, W. C., & Frederick, C. (2007). The roles of childhood maltreatment and psychopathy in sexual recidivism of treated sex offenders. *Journal of Aggression, Maltreatment and Trauma, 14*(3), 19–31.
- Douglas, K. S., Yeomans, M., & Boer, D. P. (2005).

Comparative validity analysis of multiple measures of violence risk in a sample of criminal offenders. *Criminal Justice and Behavior*, 32, 479–510.

- Edens, J. F., Marcus, D. K., Lilienfeld, S. O., & Poythress, N. G. (2006). Psychopathic, not psychopath: Taxometric evidence for the dimensional structure of psychopathy. *Journal of Abnormal Psychology*, 115, 131–144.
- Elliott, D. S., & Ageton, S. S. (1980). Reconciling race and class differences in self-reported differences in self-reported and official estimates of delinquency. *American Sociological Review*, 45, 95–110.
- First, M. B., Gibbon, M., Spitzer, R. L., Williams, J. B. W., & Benjamin, L. S. (1997). Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II) personality questionnaire. Washington, DC: American Psychiatric Press.
- Fischer, E. G. J. (2008). Profiling sexually violent predators: A study to identify psychopathy and sexual sadism as baseline psychopathologies in predatory sexual serial offenders. *Dissertation Abstracts International B: The Sciences and Engineering*, 69(1-B), 675.
- Gable, P. A., & Harmon-Jones, E. (2008). Approachmotivated positive affect reduces breadth of attention. Psychological Science, 19(5), 476–482.
- Galvan, A., Hare, T., Davidson, M., Spicer, J., Glover, G., & Casey, B. J. (2005). The role of ventral frontostriatal circuitry in reward-based learning in humans. *Journal of Neuroscience*, 25, 8650–8656.
- Gendreau, P., Goggin, C., & Paparozzi, M. (1996). Principles of effective assessment for community corrections. *Federal Probation*, 60, 64–70.
- Glenn, A. L., & Raine, A. (2009). Psychopathy and instrumental aggression: Evolutionary, neurobiological, and legal perspectives. *International Journal of Law* and Psychiatry, 32, 253–258.
- Glenn, A. L., & Raine, A. (2014). Psychopathy: An introduction to biological findings and their implications. New York: New York University Press.
- Graham, F. J., & Knight, R. A. (2017). Gender differences in the association between Self-Centered Impulsivity and Hypersexuality. Manuscript submitted for publication.
- Gray, J. A., & McNaughton, N. (2000). The neuropsychology of anxiety. Oxford, UK: Oxford University Press.
- Gretton, H. M., McBride, M., Hare, R. D., O'Shaughnessy, R., & Kumka, G. (2001). Psychopathy and recidivism in adolescent sex offenders. Criminal Justice and Behavior, 28(4), 427–449.
- Guay, J. P., & Knight, R. A. (2003, July). Taxometric analyses of psychopathy. Poster presented at the meeting of the Developmental and Neuroscience Perspectives on Psychopathy, Madison, WI.
- Guay, J. P., Ruscio, J., Knight, R. A., & Hare, R. (2007). A taxometric analysis of the latent structure of psychopathy: Evidence for dimensionality. *Journal of Abnormal Psychology*, 116, 701–716.
- Häkkänen-Nyholm, H., Repo-Tiihonen, E., Lindberg, N., Salenius, S., & Weizmann-Henelius, G. (2009).

Finnish sexual homicides: Offence and offender characteristics. *Forensic Science International*, 188, 125–130.

- Hall, J. R., Morano, M., Drislane, L. E., Patrick C. J., Lilienfeld, S. O., & Poythress, N. G. (2014). Development and validation of triarchic construct scales from the Psychopathic Personality Inventory. *Psychological Assessment*, 26(2), 447–461.
- Hanson, R. K., & Bussière, M. T. (1998). Predicting relapse: A meta-analysis of sexual offender recidivism studies. Journal of Consulting and Clinical Psychology, 66, 348–362.
- Hanson, R. K., Harris, A. J. R., Scott, T.-L., & Helmus, L. (2007). Assessing the risk of sexual offenders on community supervision: The Dynamic Supervision Project (Corrections Research User Report No. 2007-05). Ottawa: Public Safety Canada.
- Hanson, R. K., & Morton-Bourgon, K. (2004). Predictors of sexual recidivism: An updated meta-analysis 2004-02. Ottawa: Public Works and Government Services Canada.
- Hare, R. D. (2003). Hare Psychopathy Checklist—Revised (PCL-R): 2nd Edition, technical manual. Toronto: Multi-Health Systems.
- Harris, D. A., Knight, R. A., Smallbone, S., & Dennison, S. (2011). Post-release specialization and versatility in sexual offenders referred for civil commitment. *Sexual Abuse: A Journal of Research and Treatment*, 23(2), 243–259.
- Harris, D. A., & Sims-Knight, J. (2016). Predictors of sexual coercion in male and female university students. Manuscript submitted for publication.
- Harris, D. A., Smallbone, S., Dennison, S., & Knight, R. A. (2009). Offense specialization and versatility in the criminal histories of adult male sexual offenders referred for civil commitment. *Journal of Criminal Justice*, 37, 37–44.
- Harris, G. T., Rice, M. E., Hilton, N. Z., Lalumière, M. L., & Quinsey, V. L. (2007). Coercive and precocious sexuality as a fundamental aspect of psychopathy. *Journal of Personality Disorders*, 21(1), 1–27.
- Harris, G. T., Rice, M. E., & Quinsey, V. L. (1994). Psychopathy as a taxon: Evidence that psychopaths are a discrete class. *Journal of Consulting and Clinical Psychology*, 62, 387–397.
- Hawes, S. W., Boccaccini, M. T., & Murrie, D. C. (2013). Psychopathy and the combination of psychopathy and sexual deviance as predictors of sexual recidivism: Meta-analytic findings using the Psychopathy Checklist—Revised. Psychological Assessment, 25(1), 233–243.
- Henn, R. A., Herjanic, M., & Vanderpearl, R. H. (1976). Forensic psychiatry: Profiles of two types of sex offenders. American Journal of Psychiatry, 133, 694–696.
- Hill, A., Habermann, N., Berner, W., & Briken, P. (2006). Sexual sadism and sadistic personality disorder in sexual homicide. *Journal of Personality Disorders*, 20(6), 671–684.
- Hirschi, T., & Gottfredson, M. (1983). Age and the

explanation of crime. American Journal of Sociology, 89(3), 552–584.

- Ho, H., Thomson, L., & Darjee, R. (2010). Violence risk assessment: The use of the PCL-SV, HCR-20, and VRAG to predict violence in mentally disordered offenders discharged from a medium secure unit in Scotland. Journal of Forensic Psychiatry and Psychology, 20(4), 523–541.
- Holmes, K. N., & Knight, R. A. (1994, April). Exploring an interaction model of the etiology of sexual coercion. Paper presented at the 65th annual meeting of the Eastern Psychological Association, Providence, RI.
- Holt, S. E., Meloy, J. R., & Strack, S. (1999). Sadism and psychopathy in violent and sexually violent offenders. Journal of the American Academy of Psychiatry and the Law, 27, 23–32.
- Hyde, L. W., Byrd, A. L., Votruba-Drzal, E., Hariri, A. R., & Manuck, S. B. (2014). Amygdala reactivity and negative emotionality: Divergent correlates of antisocial personality and psychopathy traits in a community sample. *Journal of Abnormal Psychology*, 123(1), 214–224.
- James, R., Blair, R., Jones, L., Clark, F., & Smith, M. (1997). The psychopathic individual: A lack of responsiveness to distress cues? *Psychophysiology*, 34, 192–198.
- Jewkes, R., Sikweyiya, Y., Morrell, R., & Dunkle, K. (2011). Gender inequitable masculinity and sexual entitlement in rape perpetration South Africa: Findings of a cross-sectional study. PLOS ONE, 6(12), 1–11.
- Johnson, G. M., & Knight, R. A. (1998). Developmental antecedents of sexual coercion in adult sex offenders. Unpublished manuscript.
- Jonason, P. K., Li, N. P., Webster, G. D., & Schmitt, D. P. (2009). The Dark Triad: Facilitating a short-term mating strategy in men. *European Journal of Personality*, 23, 5–18.
- Jones, D. N., & Olderbak, S. G. (2014). The associations among dark personalities and sexual tactics across different scenarios. *Journal of Interpersonal Violence*, 29, 1050–1070.
- Kalichman, S. C., Szymanowski, D., McKee, G., Taylor, J., & Craig, M. (1989). Cluster analytically derived MMPI profile subgroups of incarcerated adult sex offenders. *Journal of Clinical Psychology*, 45, 149–155.
- Kastner, R. M., & Sellbom, M. (2012). Hypersexuality in college students: The role of psychopathy. Personality and Individual Differences 53, 644–649.
- Kennealy, P. J., Skeem, J. L., Walters, G. D., & Camp, J. (2010). Do core interpersonal and affective traits of PCL-R psychopathy interact with antisocial behavior and disinhibition to predict violence? *Psychological Assessment*, 22(3), 569–580.
- Kiehl, K. A., Smith, A. M., Hare, R. D., Mendrek, A., Forster, B. B., Brink, J., et al. (2001). Limbic abnormalities in affective processing by criminal psychopaths as revealed by functional magnetic resonance imaging. *Biological Psychiatry*, 50, 677–684.

- Kim, J. J., Guay, J. P., & Knight, R. A. (2008, August). Efficacy of the factors of psychopathy for predicting recidivism in sexual offenders: The moderating effects of offender type and time from release. Poster presented at the 116th annual conference of the American Psychological Association, Boston, MA.
- Kirsch, L. G., & Becker, J. V. (2007). Emotional deficits in psychopathy and sexual sadism: Implications for violent and sadistic behavior. *Clinical Psychology Re*view, 27, 904–922.
- Klaver, J. R., Lee, Z., Spidel, A., & Hart, S. D. (2009). Psychopathy and deception detection using indirect measures. *Legal and Criminological Psychology*, 14, 171–182.
- Knight, R. A. (1993, November). The developmental and social antecedents of sexual aggression. Invited presentation to the 12th annual conference of the Association for the Treatment of Sexual Abusers, Boston, MA.
- Knight, R. A. (1995, October). A unified developmental theory of sexual aggression: Models in the making. Paper presented at the 14th annual meeting of the Association for the Treatment of Sexual Abusers, New Orleans, LA.
- Knight, R. A. (2008, October). Self-report and life-course differences between rapists and child molesters. Symposium presented at the 27th annual Research and Treatment Conference of the Association for the Treatment of Sexual Abusers, Atlanta, GA.
- Knight, R. A. (2010). Typologies for rapists: The generation of a new structural model. In A. Schlank, (Ed.), *The sexual predator* (Vol. 4, pp. 17-1–17-28). New York: Civic Research Institute.
- Knight, R. A. (2012, October). The role of the facets of psychopathy and hypersexuality among sex offending adults. Paper presented at the 26st annual conference of the Society for Research in Psychopathology, Ann Arbor, MI.
- Knight, R. A. (2013, September). New developments in the structural models of paraphilic coercion and rape. Paper presented at the 27th annual conference of the Society for Research in Psychopathology, Oakland, CA.
- Knight, R. A., & Graham, F. J. (2015, October). An examination of hypersexuality, its latent structure and covariates within models of sexual coercion. Paper presented at the 34th annual conference of the Association for the Treatment of Sexual Abusers, Montréal, Québec, Canada.
- Knight, R. A., & Guay, J. P. (2006). The role of psychopathy in sexual offenders against women. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 512–532). New York: Guilford Press.
- Knight, R. A., Ronis, S. T., & Zakireh, B. (2009). Bootstrapping persistence risk indicators for juveniles who sexually offend. *Behavioral Sciences and the Law*, 27, 878–909.
- Knight, R. A., Rosenberg, R., & Schneider, B. (1985). Classification of sexual offenders: Perspectives,

methods and validation. In A. Burgess (Ed.), *Rape and sexual assault: A research handbook* (pp. 222–293). New York: Garland.

- Knight, R. A., & Sims-Knight, J. E. (1999, November). Family and early behavioral antecedents of sexual coercion. Paper presented at the 14th annual meeting of the Society for Research in Psychopathology, Montréal, Québec, Canada.
- Knight, R. A., & Sims-Knight, J. E. (2003). The developmental antecedents of sexual coercion against women: Testing alternative hypotheses with structural equation modeling [Special issue]. Annals of the New York Academy of Sciences, 989, 72–85.
- Knight, R. A., & Sims-Knight, J. E. (2004). Testing an etiological model for male juvenile sexual offending against females. *Journal of Child Sexual Abuse*, 13, 33–55.
- Knight, R. A., & Sims-Knight, J. E. (2011). Risk factors for sexual violence. In J. W. White, M. P. Koss, & A. E. Kazdin (Eds.), Violence against women and children: Mapping the terrain (Vol. 1, pp. 125–172). Washington, DC: American Psychological Association.
- Knight, R. A., & Sims-Knight, J. E. (2013, November). Tracking the antecedents and predictors of rape: Abuse, hypersexuality, callousness, antisociality, and PCD. Symposium presented at the 32rd annual conference of the Association for the Treatment of Sexual Abusers, Chicago, IL.
- Knight, R. A., & Sims-Knight, J. E. (2016). A theoretical integration of aetiological and typological models of rape. In D. P. Boer (Ed.), *The Wiley handbook on the theories, assessment, and treatment of sexual offending* (pp. 73–102). New York: Wiley.
- Knight, R. A., Sims-Knight, J. E., & Guay, J. P. (2013). Is a separate disorder category defensible for paraphilic coercion? *Journal of Criminal Justice*, 41, 90–99.
- Knight, R. A., & Thornton, D. (2007). Evaluating and improving risk assessment schemes for sexual recidivism: A long-term follow-up of convicted sexual offenders. Available from www.ncjrs.gov/pdffiles1/nij/ grants/217618.pdf.
- Koss, M. P., & Dinero, T. E. (1988). Predictors of sexual aggression among a national sample of male college students [Special issue]. Annals of the New York Academy of Sciences, 528, 133–147.
- Krupp, D. B., Sewall, L. A., Lalumière, M. L., Sheriff, C., & Harris, G. T. (2013). Nepotistic patterns of violent psychopathy: Evidence for adaptation? *Frontiers in Psychology*, 4, Article 139.
- LeBreton, J. M., Baysinger, M. A., Abbey, A., & Jacques-Tiura, A. J. (2013). The relative importance of psychopathy-related traits in predicting impersonal sex and hostile masculinity. *Personality and Individual Differences*, 55, 817–822.
- Leistico, A.-M. R., Salekin, R. T., DeCoster, J., & Rogers, R. (2008). A large-scale meta-analysis relating the Hare measures of psychopathy to antisocial conduct. Law and Human Behavior, 32, 28–45.
- Levenson, M. R., Kiehl, K. A., & Fitzpatrick, C. M.

(1995). Assessing psychopathic attributes in a noninstitutionalized population. *Journal of Personality and Social Psychology*, 68, 151–158.

- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment*, 66, 488–524.
- Liu, J. (2014). The mediator effect of psychopathy between pornography and sadism. Unpublished master's thesis, Brandeis University, Waltham, MA.
- Lohr, B. A., Adams, H. E., & Davis, J. M. (1997). Sexual arousal to erotic and aggressive stimuli in sexually coercive and noncoercive men. *Journal of Abnormal Psychology*, 106, 230–242.
- Lord, S. (2012). Use of the Self-Report Psychopathy Scale– III facet scores in predicting dating violence and sexual aggression. Published by ProQuest LLC (2013). Copyright in the Dissertation held by the Author.
- Lussier, P., LeBlanc, M., & Proulx, J. (2005). The generality of criminal behaviour: A confirmatory factor analysis of the criminal activity of sex offenders in adulthood. *Journal of Criminal Justice*, 33, 177–189.
- Ly, M., Motzkin, J. C., Philippi, C. L., Kirk, G. R., Newman, J. P., Kiehl, K. A., et al. (2012). Cortical thinning in psychopathy. *American Journal of Psychiatry*, 169, 743–749.
- Lyndon, A. E., White, J. W., & Kadlec, K. M. (2007). Manipulation and force as sexual coercion tactics: Conceptual and empirical differences. Aggressive Behavior, 33, 291–303.
- Malamuth, N. M. (1986). Predictors of naturalistic sexual aggression. Journal of Personality and Social Psychology, 5, 953–962.
- Malamuth, N. M. (1998). An evolutionary-based model integrating research on the characteristics of sexually coercive men. In J. Adair, K. Deon, & D. Belanger, D. (Eds.), Advances in psychological science: Social, personal, and developmental aspects (Vol. 1, pp. 151–184). Hove, UK: Psychology Press/Erlbaum.
- Malamuth, N. M. (2003). Criminal and noncriminal sexual aggressors: Integrating psychopathy in a hierarchical–mediational confluence model [Special issue]. Annals of the New York Academy of Sciences, 989, 33–58.
- Malamuth, N. M., & Hald, G. M. (2016). The confluence meditational model of sexual aggression. In D. P. Boer (Ed.), The Wiley handbook on the theories, assessment, and treatment of sexual offending (pp. 53–71). New York: Wiley.
- Malamuth, N. M., Linz, D., Heavey, C. L., Barnes, G., & Acker, M. (1995). Using the confluence model of sexual aggression to predict men's conflict with women: A 10-year follow-up study. *Journal of Personality and Social Psychology*, 69, 353–369.
- Malamuth, N. M., Sockloskie, R. J., Koss, M. P., & Tanaka, J. S. (1991). Characteristics of aggressors against women: Testing a model using a national sample of college students. *Journal of Consulting and Clinical Psychology*, 59, 670–681.

- Mann, R. E., Hanson, R. K., & Thornton, D. (2010). Assessing risk for sexual recidivism: Some proposals on the nature of psychologically meaningful risk factors. Sexual Abuse: A Journal of Research and Treatment, 22, 191–217.
- Marcus, D. K., John, S. L., & Edens, J. F. (2004). A taxometric analysis of psychopathic personality. *Journal* of Abnormal Psychology, 113, 626–635.
- Marcus, D. K., Lilienfeld, S. O., Edens, J. E., & Poythress, N. G. (2006). Is antisocial personality disorder continuous or categorical?: A taxometric analysis. *Psychological Medicine*, 36, 1571–1582.
- Marcus, D. K., Sanford, G., Edens, J. F., Knight, R. A., & Walters, G. D. (2011). Taxometrics and evolutionary theory: The case of the psychopathic sexuality taxon. Scientific Review of Mental Health Practice, 8, 6–16.
- Mealey, L. (1995). The sociobiology of sociopathy: An integrated evolutionary model. *Behavioral and Brain Sciences*, 18, 523–599.
- Meloy, J. R. (1997). The psychology of wickedness: Psychopathy and sadism. *Psychiatric Annals*, 27(9), 630–633.
- Meloy, J. R. (2000). The nature and dynamics of sexual homicide: An integrative review. Aggression and Violent Behavior, 5, 1–22.
- Mokros, A., Osterheider, M., Hucker, S. J., & Nitschke, J. (2011). Psychopathy and sexual sadism. Law and Human Behavior, 35, 188–199.
- Mokros, A., Schilling, F., Weiss, K., Nitschke, J., & Eher, R. (2014). Sadism in sexual offenders: Evidence for dimensionality. *Psychological Assessment*, 26, 138– 147.
- Mouilso, E. R., & Calhoun, K. S. (2012). A mediation model of the role of sociosexuality in the associations between narcissism, psychopathy, and sexual aggression. Psychology of Violence, 2(1), 16–27.
- Mouilso, E. R., & Calhoun, K. S. (2013). The role of rape myth acceptance and psychopathy in sexual assault perpetration. *Journal of Aggression, Maltreatment and Trauma*, 22, 159–174.
- Multidimensional Inventory of Development, Sex, and Aggression (MIDSA). (2011). MIDSA clinical manual (3rd ed.). Bend, OR: Augur Enterprises. Available from www.midsa.us.
- Muñoz, L. C., Khan, R., & Cordwell, L. (2010). Sexually coercive tactics used by university students: A clear role for primary psychopathy. *Journal of Personality Disorders*, 25(1), 28–40.
- Murrie, D. C., Boccaccini, M. T., Caperton, J., & Rufino, K. (2012). Field validity of the Psychopathy Checklist—Revised in sex offender risk assessment. *Psychological Assessment*, 24(2), 524–529.
- Murrie, D. C., Marcus, D. K., Douglas, K. S., Salekin, R. S., Lee, Z., & Vincent, G. (2007). Youth with psychopathy features are not a discrete class: A taxometric analysis. *Journal of Child Psychology and Psychia*try, 48, 714–723.
- Nelson, E., Leibenluft, E., McClure, E., & Pine, D.

(2005). The social re-orientation of adolescence: A neuroscience perspective on the process and its relation to psychopathology. *Psychological Medicine*, *35*, 163–174.

- Neumann, C. S., Malterer, M. B., & Newman, J. P. (2008). Factor structure of the Psychopathic Personality Inventory (PPI): Findings from a large incarcerated sample. *Psychological Assessment*, 20(2), 169–174.
- Newman, J. P., & Baskin-Sommers, A. R. (2011). Early selective attention abnormalities in psychopathy: Implications for self-regulation. In M. I. Posner (Ed.), *Cognitive neuroscience of attention* (2nd ed., pp. 421– 440). New York: Guilford Press.
- Nitschke, J., Osterheider, M., & Mokros, A. (2009). A cumulative scale of severe sexual sadism. Sexual Abuse: A Journal of Research and Treatment, 21, 262–278.
- Olver, M. E., Christofferson, S. M. B., Grace, R. C., & Wong, S. C. P. (2014). Incorporating change information into sexual offender risk assessments using the Violence Risk Scale–Sexual Offender Version. Sexual Abuse: A Journal of Research and Treatment, 26, 472–499.
- Olver, M. E., Klepfisz, G., Stockdale, K. C., Kingston, D. A., Nicholaichuk, T. P., & Wong, S. C. P. (2016). Some notes on the validation of VRS-SO static scores. *Journal of Sexual Aggression*, 22, 147–160.
- Olver, M. E., Neumann, C. S., Kingston, D. A., Nicholaichuk, T. P., & Wong, S. C. P. (2016). Construct validity of the Violence Risk Scale–Sexual Offender version instrument in a multisite sample of treated sexual offenders. Assessment. [Epub ahead of print]
- Olver, M. E., & Wong, S. C. P. (2006). Psychopathy, sexual deviance, and recidivism among sex offenders. *Sexual Abuse: A Journal of Research and Treatment*, 18(1), 65–82.
- Olver, M. E., Wong, S. C. P., Nicholaichuk, T., & Gordon, A. (2007). The validity and reliability of the Violence Risk Scale–Sexual Offender Version: Assessing sex offender risk and evaluating therapeutic change. *Psychological Assessment*, 19(3), 318–329.
- Parent, G., Guay, J. P., & Knight, R. A. (2011). An assessment of long-term risk of recidivism by adult sex offenders: One size doesn't fit all. Criminal Justice and Behavior, 38, 188–209.
- Patrick, C. J., & Drislane, L. E. (2015). Triarchic model of psychopathy: Origins, operationalizations, and observed linkages with personality and general psychopathology. *Journal of Personality*, 83, 627–643.
- Patrick, C. J., Foell, J., Venables, N. C., & Worthy, D. A. (2016). Substance use disorders as externalizing outcomes. In T. P. Beauchaine & S. P. Hinshaw (Eds.), Oxford handbook of externalizing spectrum disorders (pp. 38–60). New York: Oxford University Press.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, 21, 913–938.

- Paulhus, D. L., Neumann, C. S., Hare, R. D., Williams, K. M., & Hemphill, J. F. (2016). Manual for the Self-Report Psychopathy Scale, 4th ed. Toronto: Multi-Health Systems.
- Paulhus, D. L., & Williams, K. M. (2002). The Dark Triad of personality: Narcissism, Machiavellianism, and psychopathy. *Journal of Research in Personality*, 36, 556–563.
- Payne, D. L., Lonsway, K. A., & Fitzgerald, L. F. (1999). Rape myth acceptance: Exploration of its structure and its measurement using the Illinois Rape Myth Acceptance Scale. Journal of Research in Personality, 33(1), 27–68.
- Persons, R. W., & Marks, P. A. (1971). The violent 4-3 M.M.P.I. personality type. Journal of Consulting and Clinical Psychology, 36, 189–196.
- Pianka, E. R. (1970). On r and K selection. American Naturalist, 104, 592–597.
- Porter, S., Woodworth, M., Earle, J., Drugge, J., & Boer, D. P. (2003). Characteristics of violent behavior exhibited during sexual homicides by psychopathic and non-psychopathic murderers. *Law and Human Behavior*, 27(5), 459–470.
- Prentky, R. A., & Knight, R. A. (1991). Identifying critical dimensions for discriminating among rapists. Journal of Consulting and Clinical Psychology, 59, 643–661.
- Quinsey, V. L., & Lalumière, M. L. (1995). Psychopathy is a non-arbitrary class. Behavioral and Brain Sciences, 18, 571.
- Rada, R. T. (1978). Classification of the rapist. In R. T. Rada (Ed.), *Clinical aspects of the rapist* (pp. 117–132). New York: Grune & Stratton.
- Rader, C. M. (1977). MMPI profile types of exposers, rapists, and assaulters in a court service population. *Journal of Consulting and Clinical Psychology*, 45, 61–69.
- Rappaport, K., & Burkhart, B. R. (1984). Personality and attitudinal characteristics of sexually coercive college males. *Journal of Abnormal Psychology*, 93, 216–221.
- Raskin, R., & Hall, C. S. (1979). A Narcissistic Personality Inventory. Psychological Reports, 45, 590.
- Raskin, R., & Terry, H. (1988). A principal-components analysis of the Narcissistic Personality Inventory and further evidence of its construct validity. *Journal of Personality and Social Psychology*, 54, 890–902.
- Robertson, C. A., & Knight, R. A. (2014). Relating sexual sadism and psychopathy to one another, nonsexual violence, and sexual crime behaviors. Aggressive Behavior, 40(1), 12–23.
- Rogers, R., & Cruise, K. R. (2000). Malingering and deception among psychopaths. In C. B. Gacono (Ed.), *The clinical and forensic assessment of psychopathy: A practitioner's guide* (pp. 269–284). Mahwah, NJ: Erlbaum.
- Ruscio, J., Haslam, N., & Ruscio, A. M. (2006). Introduction to the taxometric method: A practical guide. Mahwah, NJ: Erlbaum.

- Serin, R. C., Mailloux, D. L., & Malcolm, P. B. (2001). Psychopathy, deviant sexual arousal, and recidivism among sexual offenders. *Journal of Interpersonal Violence*, 16, 234–246.
- Sims-Knight, J. E. (2013, November). Mapping developmental antecedents onto the components of rape: Specific and cumulative effects. Paper presented at the 32rd annual conference of the Association for the Treatment of Sexual Abusers, Chicago, IL.
- Sims-Knight, J. E., & Guay, J. P. (2011, November). Is PCD a construct distinct from sadism? Paper presented at the 30th annual conference of the Association for the Treatment of Sexual Abusers, Toronto, Canada.
- Singh, J. P., Grann, M., & Fazel, S. (2011). A comparative study of violence risk assessment tools: A systematic review and metaregression analysis of 68 studies involving 25,980 participants. *Clinical Psychology Review*, 31, 499–513.
- Skilling, T. A., Harris, G. T., Rice, M. E., & Quinsey, V. L. (2002). Identifying persistently antisocial offenders using the Hare Psychopathy Checklist and DSM Antisocial Personality Disorder criteria. *Psychological Assessment*, 14, 27–38.
- Smallbone, S., Wheaton, J., & Hourigan, D. (2003). Trait empathy and criminal versatility in sexual offenders. Sexual Abuse: A Journal of Research and Treatment, 15, 49–60.
- Steinberg, L. (2008). A social neuroscience perspective on adolescent risk-taking. *Developmental Review*, 28(1), 78–106.
- Stoléru, S., Fonteille, V., Cornélis, C., Joyal, C., & Moulier, V. (2012). Functional neuroimaging studies of sexual arousal and orgasm in healthy men and women: A review and meta-analysis. *Neuroscience* and Biobehavioral Reviews, 36, 1481–1509.
- Thornton, D., & Knight, R. A. (2015). Construction and validation of SRA-Need Assessment. Sexual Abuse: A Journal of Research and Treatment, 27(4), 360–375.
- Urbaniok, F., Endrass, J., Rossegger, A., & Noll, T. (2007). Violent and sexual offences: A validation of the predictive quality of the PCL:SV in Switzerland. *International Journal of Law and Psychiatry*, 30, 147–152.
- Vasey, M. W., Kotov, R., Frick, P. J., & Loney, B. R. (2005). The latent structure of psychopathy in youth: A taxometric investigation. *Journal of Abnormal Child Psychology*, 33, 411–429.
- Veit, R., Flor, H., Erb, M., Hermann, C., Lotze, M., Grodd, W., & Birbaumer, N. (2002). Brain circuits involved in emotional learning in antisocial behavior and social phobia in humans. *Neuroscience Letters*, 328, 233–236.
- Visser, B. A., Pozzebon, J. A., Bogaert, A. F., & Ashton, M. C. (2010). Psychopathy, sexual behavior, and esteem: It's different for girls. *Personality and Individual Differences*, 48, 833–838.

- Walters, G. D., Brinkley, C. A., Magaletta, P. R., & Diamond, P. M. (2008). Taxometric analysis of the Levenson Self-Report Psychopathy scale. *Journal of Personality Assessment*, 90, 491–498.
- Walters, G. D., Duncan, S. A., & Mitchell-Perez, K. (2007). The latent structure of psychopathy: A taxometric investigation of the Psychopathy Checklist— Revised in a heterogeneous sample of male prison inmates. Assessment, 14, 270–278.
- Walters, G. D., Ermer, E., Knight, R. A., & Kiehl, K. A. (2015). Paralimbic biomarkers in a taxometric analysis of psychopathy: Does changing the indicators change the conclusion? *Personality Disorders: Theory*, *Research, and Treatment*, 6, 41–52.
- Walters, G. D., Gray, N., Jackson, R., Sewell, K., Rogers, R., Taylor, I., et al. (2007). A taxometric analysis of the Psychopathy Checklist: Screening Version (PCL:SV): Further evidence of dimensionality. Psychological Assessment, 19, 330–339.
- Walters, G. D., Knight, R. A., Grann, M., & Dahle, K.-P. (2008). Incremental validity of the Psychopathy Checklist facet scores: Predicting release outcome in six samples. *Journal of Abnormal Psychology*, 117, 396–405.
- Walters, G. D., Marcus, D. K., Edens, J. F., Knight, R. A., & Sanford, G. (2011). In search of the psychopathic sexuality taxon: Indicator size does matter. *Behavioral Sciences and the Law*, 29(1), 1–17.
- Williams, K. M., Cooper, B. S., Howell, T. M., Yuille, J. C., & Paulhus, D. L. (2009). Inferring sexually deviant behavior from corresponding fantasies: The role of personality and pornography consumption. Criminal Justice and Behavior, 36, 198–222.
- Williams, K. M., Paulhus, D. L., & Hare, R. D. (2007). Capturing the four-factor structure of psychopathy in college students via self-report. *Journal of Personality Assessment*, 88, 205–219.
- Witt, E. A., Donnellan, M. B., Blonigen, D. M., & Patrick, C. J. (2011, May). A meta-analytic factor analysis of the Psychopathic Personality Inventory. Poster presented at the 4th biennial meeting of the Society for the Scientific Study of Psychopathy, Montréal, Québec.
- Woodworth, M., Freimuth, T., Hutton, E. L., Carpenter, T., Agar, A. D., & Logan, M. (2013). High-risk sexual offenders: An examination of sexual fantasy, sexual paraphilia, psychopathy, and offence characteristics. *International Journal of Law and Psychiatry*, 36, 144–156.
- Woodworth, M., & Porter, S. (2002). In cold blood: Characteristics of criminal homicides as a function of psychopathy. *Journal of Abnormal Psychology*, 111, 436–445.
- Yoon, J., & Knight, R. A. (2011). Sexual material perception in sexually coercive males: Disattending deficit and its covariates. Sexual Abuse: A Journal of Research and Treatment, 23(2), 275–292.

# CHAPTER 28

# Risk for Criminal Recidivism The Role of Psychopathy

KEVIN S. DOUGLAS GINA M. VINCENT JOHN F. EDENS

t the outset of our chapter for the first edition of this book (Douglas, Vincent, & Edens, 2006), we noted that there was a spirited debate over the usefulness and appropriate role of psychopathy-and its primary measurement tools such as the Hare Psychopathy Checklist-Revised (PCL-R, Hare, 1991, 2003)-in decision making regarding people's liberty on the basis of their likelihood of future criminal behavior and violence (Gendreau, Goggin, & Smith, 2002; Hemphill & Hare, 2004). What has changed? Is there more or less consensus on key issues? As we review in this chapter, the field as it stands today permits somewhat similar conclusions to the field as those circa 2006. Psychopathy, in particular, as indexed by the PCL-R and its derivatives (referred to hereafter as "PCL measures"), shows moderatesize associations with most forms of future crime and violence. However, there has been substantial development in certain areas, allowing more finely graded analyses, caveats, and hence conclusions.

As was true when we wrote the initial version of this chapter, there remains immense pressure within criminal justice, forensic, and psychiatric settings to "make the right decision" about which persons are either safe to release into the community or require extra management within an institution. There are at least 15 junctures within the mental health, criminal justice, and family law realms that require decision making about risk for crime and violence (Lyon, Hart, & Webster, 2001; Shah, 1978; Wilson & Douglas, 2009). PCL-R psychopathy has played an important role in decisions of these types for decades now. Since publication of our original chapter in 2006, however, certain developments in the field have fueled concerns about placing measures of psychopathy at the center of risk assessment. Chief among these are (1) research suggesting that several special-purpose violence risk assessment instruments consistently outperform the PCL-R in quantifying risk; (2) growing evidence that measures of psychopathy often fail to demonstrate incremental validity beyond other risk factors; (3) findings that the reliability and perhaps validity of the PCL-R may be substantially lower in adversarial "field settings" than in nonadversarial field settings or research settings; and (4) work showing that interpersonal and affective features of psychopathy are, at best, weakly predictive of the occurrence of crime and violence.

In addition to considering these recent developments in some detail, this chapter provides updates on previously discussed topics. In particular, we (1) provide a synthesis and interpretation of criminal recidivism prediction research, focusing on recent meta-analytic studies and the impact of methodological and measurement factors; (2) evaluate the generalizability of the predictive utility of psychopathy across settings and samples (medicolegal contexts; community settings; institutional settings; sexual violence; intimate partner violence: intellectual disability: children and adolescents; gender; race, ethnicity and country); (3) evaluate the incremental validity of psychopathy, in particular as indexed by total and facet scores of PCL measures relative to other risk factors and risk assessment instruments; (4) explore the relevance of theories and models of psychopathy to the connection between psychopathy and violence; (5) discuss the role of psychopathy within contemporary violence risk assessment; and (6) discuss the role of psychopathy in the contexts of risk management and treatment more broadly. In addition, within these sections, we devote coverage to the ever-burgeoning literature on self-report measures of psychopathy and their putative associations with recidivism, and newly developed conceptual models of psychopathy (i.e., the triarchic model; the Comprehensive Assessment of Psychopathic Personality) and their respective measures, and their relevance to recidivism.

# **Evidence from Meta-Analyses**

There are now scores of primary empirical studies on the link between psychopathy (particularly using the PCL measures) and recidivism—far too many to review separately. As such, we focus first on meta-analyses, drawing on primary studies to "fill in the details" in subsequent sections. Metaanalyses of data from special populations (i.e., youth) are covered separately under the relevant chapter section. Prediction results for PCL measures are considered in relation to findings for the following other risk assessment instruments: Historical, Clinical, Risk Management-20 (HCR-20 Version 2 [Webster, Douglas, Eaves, & Hart, 1997], HCR-20 Version 3 [Douglas, Hart, Webster, & Belfrage, 2013]); Offender Group Reconviction Scale (OGRS; Copas & Marshall, 1998); Structured Assessment of Violence Risk in Youth (SAVRY; Borum, Bartel, & Forth, 2006); Spousal Assault Risk Assessment (SARA; Kropp, Hart, Webster, & Eaves, 1999); Sexual Violent Risk-20 (SVR-20; Boer, Hart, Kropp, & Webster, 1997); Violence Risk Appraisal Guide (VRAG; Quinsey, Harris, Rice, & Cormier, 1998, 2006); Youth Level of Service/Case Management Inventory (YLS/CMI; Hoge & Andrews, 2003); Level of Service Inventory—Revised (LSI-R; Andrews & Bonta, 1995).

Salekin, Rogers, and Sewell (1996) conducted the first meta-analysis of 18 psychopathy-crime studies, and reported mean effect sizes (Cohen's d) of 0.79 for violent institutional and community behavior (based on 13 of 18 studies) and 0.55 for general (violent or nonviolent) criminal recidivism (10 of 18 studies) across both prospective and retrospective studies. Using a somewhat larger sample of prospective studies than Salekin and colleagues (1996), Hemphill, Templeman, Wong, and Hare (1998) examined the recidivism rates of offenders released into the community and obtained weighted correlations of .27 for general recidivism (total N = 1,275), .27 for violent recidivism (total N = 1,374), and .23 for sexual recidivism (total N = 178).

Following Hemphill, Templeman, and colleagues (1998), two other published meta-analyses (Gendreau et al., 2002; Walters, 2003a; see also Walters, 2003b) provided coverage of an even larger number of studies examining the relationship between psychopathy and future criminal behavior. Gendreau and colleagues (2002) reported weighted effect sizes for the PCL-R of  $\Phi = 0.23$ (95% confidence interval [CI] = .17-.28) for general recidivism (k = 33 studies) and .21 (95% CI = .17-.25) for violent recidivism (k = 26 studies). Using somewhat different measures of effect size, Walters (2003a) reported a weighted point biserial correlation of .26 (95% CI = .24-.29) for prediction of general recidivism by PCL-R scores across 33 studies. Subsequently, Walters (2003b) reported that PCL-R Factor 1 showed lower predictive associations with general (r = .15) and violent (r = .18)recidivism than Factor 2 (r = .32 and .26, respectively, for these same outcome variables). However, considerable heterogeneity in coefficients across studies was noted.

More recently, in what remains the most comprehensive meta-analysis of findings for PCL measures, Leistico, Salekin, DeCoster, and Rogers (2008) conducted a large-scale meta-analysis of data from 95 samples in which relations of the various PCL measures with antisocial conduct (both institutional and community indicators) were examined. Analyses of relations for PCL Factors 1 and 2 were based on data from subsets of 54 samples and 53 samples, respectively. Moderate effect sizes were found for the total PCL-R scores and Factor 2 scores (median d's = 0.57 and 0.58, respectively), whereas the d for Factor 1 scores was statistically significant but much lower (0.38). Moderation analyses showed that age, institutional or community setting, type of outcome (violent vs. nonviolent), and PCL version (youth vs. adult) did not impact effect sizes. However, there were some variables that moderated (increased, in most cases) the predictive strength of PCL-R scores, including country (higher effect sizes for Canadian and European samples for PCL-R total and Factor 2 scores); longer follow-up times (higher effects for Factor 2); more females in the sample (higher effect sizes for total and Factor 1 scores); forensic or psychiatric patients compared to offenders (higher effects for Factor 2); use of file-only versus file + interview rating methods (higher effects for total and Factor 2 scores); and predictive as opposed to postdictive designs (higher effects for PCL-R total scores, but lower effects for Factor 1).

Focusing on more recent literature (1999 to 2008), Yang, Wong, and Coid (2010) evaluated the PCL measures against commonly used risk assessment instruments, using the former as a benchmark for evaluating the incremental validity of other risk instruments. Most of the instruments examined in this work, including the PCL-R, produced moderate effect sizes, although Factor 1 of the PCL-R did not perform better than chance, with a meta-analytic correlation of only .11. Only two violence risk assessment instruments were able to significantly improve on the PCL-R's association with violence: the HCR-20 (based on 16 studies) and the OGRS (based on two studies; Copas & Marshall, 1998). In another meta-analysis comparing results for various risk assessment measures with prediction for the PCL (68 studies), Singh, Grann, and Fazel (2011) reported that the PCL-R produced the *lowest* predictive validity for violent outcomes. The distribution of effect sizes was fairly constricted, however, with area under the curve (AUC) values ranging from .66 (PCL-R) to .78 (Sexual Violence Risk-20; Boer, Hart, Kropp, & Webster, 1997). In an overlapping meta-analysis of 73 studies, Fazel, Singh, Doll, and Grann (2012) reported that violence risk measures such as the HCR-20, SAVRY, VRAG, and SARA (Kropp et al., 1999) tended to predict violence more effectively than either the PCL scales or scales developed to assess general crime propensity.

The magnitude of the mean effects reported in these meta-analyses clearly supports the presence of a general relationship between PCL-defined psychopathy and future criminal conduct, particularly when contrasted with the lower relative magnitude of association reported for most risk factors in other meta-analyses of the recidivism literature (Bonta, Law, & Hanson, 1998; Gendreau, Little, & Goggin, 1996). Despite this general conclusion, the heterogeneity evident in these meta-analyses raises some concerns about the aggregation of very diverse effect sizes across available studies and suggests that there may be factors that significantly moderate the association between psychopathy and recidivism. We address this issue in detail in the sections that follow.

# Impact of Methodological Factors

Basic research methods can vary substantially across recidivism studies, and we believe that some of the heterogeneity across studies in the meta-analyses discussed earlier is attributable to this, as suggested in particular by Leistico and colleagues' (2008) meta-analysis. Thus, it is important to be aware of the limitations of alternative methodological approaches when evaluating and interpreting the results of different studies (for a review of methodological issues in risk assessment research, see Douglas, Skeem, & Nicholson, 2011). We categorize these methodological factors into (1) design variation; (2) variation in measurement of psychopathy; (3) variation in measurement of recidivism and testing of outcomes; and (4) variation in the purpose of data collection (field vs. research).

# **Design Variation**

The most important point to make with respect to design variation is that postdictive studies of the psychopathy-crime relationship (correlating psychopathy with previous crime) are inherently limited because most measures of psychopathy contain items relating to criminal behavior. As such, the risk of criterion contamination (i.e., correlating something with itself) and spurious inflation of effect sizes is great. More informative are prospective studies in which the scoring of the psychopathy measure precedes the outcome of interest, hence eliminating the probability that the same episode of criminal behavior is used both to score the predictor and the predictand. This is why we focus, where possible, on prospective or pseudoprospective studies. In postdictive analyses, it is very important to remove items from the psychopathy measure that focus squarely on criminal behavior, in order to avoid criterion contamination. This can also be important in prospective designs if the researcher wishes to test whether the aspects of psychopathy that are not dependent on criminal behavior predict recidivism. In the Leistico and colleagues (2008) meta-analysis, although prospective studies produced larger effect sizes for total scores, Factor 1 scores were more strongly related to crime and violence in postdictive designs. This finding could be attributable to knowledge of past crime influencing ratings of these scores (i.e., "This person *must* be callous and cunning to have committed those types of crimes").

#### Variation in Measurement of Psychopathy

It is quite interesting to note that self-report measures historically have shown only modest correlations with the interview- and file-based PCL measures, particularly their affective and interpersonal features (for an overview, see Hare, 2003). There are multiple reasons why this may be the case, ranging from a "method-mode mismatch" to outright deceptiveness among psychopathic offenders (see Edens, Hart, Johnson, Johnson, & Olver, 2000, for a review; see also Sellbom, Lilienfeld, Fowler, & McCrary, Chapter 10, this volume). However, these relatively modest correlations do not preclude the possibility that self-report measures might provide useful information in the prediction of future behavior, as there is considerable unexplained variance when using PCL-defined psychopathy to forecast such outcomes. Walters (2006) examined the utility of "content relevant" self-report measures in relation to more widely accepted measures of risk that minimize or exclude self-report information, such as the PCL-R or the VRAG (Quinsey et al., 1998, 2006), a 12-item actuarial violence prediction instrument that relies primarily on static risk factors that can be scored from file information. Perhaps somewhat surprisingly, there was no appreciable difference in the magnitude of the effects reported across these types of assessment procedures (weighted r of .28 for self-report vs. .31 for risk measures), although the total number of direct comparisons was relatively small (k = 12).

More recently, Gardner, Boccaccini, Bitting, and Edens (2014) reported meta-analytic findings regarding the relationship between the Antisocial Features (ANT) scale (and other scales) from the Personality Assessment Inventory (PAI; Morey, 2007) and violence or misconduct. Examining effect sizes from over 30 studies, scores on the ANT consistently emerged as small to moderate predictors of misbehavior (d = 0.26 to 0.39), as did the Aggression (AGG) scale embedded in the PAI (d = 0.23 to 0.40). Effects for ANT tended to be stronger in correctional than in treatment settings (d = 0.44 vs. 0.20), for institutional misconduct compared to recidivism (e.g., AGG d = 0.37vs. 0.23), and for institutional misconduct studies with more extensive follow up periods (e.g., ANT d = 0.46).

Similarly, a meta-analysis (Miller & Lynam, 2012) of the self-report Psychopathic Personality Inventory (PPI) and its revision (PPI-R) showed moderate to large associations between its Self-Centered Impulsivity (SCI) scale (akin to PCL-R Factor 2) and "general externalizing" (r = .45), aggression (r = .33), and antisocial behavior (r = .32). However, most of these effects were based on cross-sectional or postdictive studies; hence, as discussed earlier, they are less meaningful than prospective studies with respect to assessment of recidivism risk. The PPI-R's Fearless Dominance (FD) scale (akin to PCL-R Factor 2) showed very small associations with externalizing (r = .06), aggression (r = .04), and antisocial behavior (r = .12).

Although a meta-analysis can be informative about the absolute magnitude of associations between predictor and criterion variables, it does not inform our understanding of the incremental validity (Sechrest, 1963) of one predictor versus another-unless alternative predictors have been directly compared in a sufficient number of studies to warrant aggregation of effect sizes that represent the unique variance attributable to each measure (e.g., a meta-analysis of partial correlations). Direct comparisons of self-report measures to the PCL family of measures have generally suggested that both may account for unique variance in predicting recidivism beyond the other. The aforementioned study by Walters (2006) provided the most extensive examination of this issue to date by comparing the incremental validity of various selfreport scales to the PCL family of measures in relation to various outcome criteria, such as criminal recidivism and institutional misconduct (see Walters, 2006, Table 6). In 10 of the 19 comparisons, self-report measures accounted for additional variance beyond the PCL measures, whereas in eight of the 19 comparisons, PCL-defined psychopathy explained variance beyond the self-report scales. In two comparisons, measures of both types explained unique variance. We return to the topic of incremental validity of psychopathy vis-à-vis risk assessment measures and other risk factors in a later section.

#### Variation in Measurement of Outcomes

Recidivism studies vary widely in how they operationalize outcomes (i.e., reoffense behavior). Some make a distinction between general and violent recidivism, while others consider "any recidivism." Some define violence broadly to include verbal aggression, threats, and arson, whereas others define violence narrowly (i.e., only as physical harm to a person). Some researchers define recidivism narrowly, according to postrelease community incidents only, whereas others include institutional misconduct and conditional release violations as well. Most studies employ a single method for measuring recidivism-most typically, official criminal records (although even here studies differ in terms of their use of arrests vs. convictions as outcomes). However, some studies use a multimethod approach, in which official records are supplemented with self-reports and collateral informants. In general, broader definitions of violence and longer follow-up periods lead to higher base rates of recidivism and more powerful statistical predictions (Hemphill, Hare, & Wong, 1998; Leistico et al., 2008). Furthermore, self-report measures of violence generate significantly greater and ostensibly more accurate reports of violent incidents (e.g., Lahey et al., 1998; Monahan et al., 2001; Silverthorn, Frick, & Reynolds, 2001). For example, in their community follow-up of civil psychiatric patients, Monahan and colleagues (2001) found that the base rate for violent incidents identified via self-reports significantly exceeded the base rate for violent incidents identified via official records. Applying a basic principle of forensic assessment, it is reasonable to assume that self-reports of negative behaviors, being statements against self-interest, are accurate unless there are external reasons to portray oneself in a negative light.

Additional variability is associated with the metric used to quantify recidivism (Hart, 1998), which is dependent on the outcome of interest. Generally, statistics that use dichotomous outcomes (e.g.,  $\chi^2$ ,  $\Phi$ ) underestimate predictive accuracy because these do not reflect the full complexity of the data (Hart, 1998), particularly when individuals in the sample have different lengths of time at risk, which is often the case. On the other hand, statistical techniques that *incorporate time at risk* prior to reoffending, such as survival or Cox regression analysis, can improve the sensitivity of outcome measures and thereby enhance predictive accuracy. As an illustration of this, Richards, Casey, and Lucente (2003) reported that while the

PCL-R was not related to the simple dichotomous occurrence of postrelease recidivism in a sample of female offenders, it was strongly related to the time to ("hazard for") recidivism in survival analyses (e.g., each 1-point increase on Factor 1 was associated with an 11% increase in the hazard for recidivism).

# Variability in Purpose of Data Collection (Field vs. Research)

The vast majority of research on psychopathy has been conducted for investigative purposes by researchers who place a premium on training of raters and interrater reliability, or has been drawn from applied, nonadversarial settings (e.g., within forensic or correctional settings). In such settings, reliability tends to be good. However, a recent line of research has suggested that when the PCL-R is used in legal settings, its reliability is lower. The direct implication of these findings for our purpose is that validity could be lower as well. Other implications, of course, include the potential for decisions about an individual's risk status-for example, as a sexually violent predator-to be influenced by PCL-R ratings that vary widely as a function of the side for which experts testify.

The first study to investigate this issue revealed a PCL-R total score reliability of only .39 between state- and defense-retained experts in the context of sexually violent predator litigation (Murrie, Boccaccini, Johnson, & Janke, 2008). State and defense PCL-R total scores differed by eight points on average (26 vs. 18), which is more than double the instrument's standard error of measurement. Subsequent research has generally yielded results consistent with this original finding of markedly lower reliability than the "typical" .80+ reported in published research articles. Corroborative findings have emerged from work in other U.S. jurisdictions (DeMatteo et al., 2014; Murrie et al., 2009), using experts retained by the same side (Boccaccini, Turner, & Murrie, 2008; Boccaccini, Turner, Murrie, & Rufino, 2012; Miller, Kimonis, Otto, Kline, & Wasserman, 2012; Sturup et al., 2014) and experimental rather than naturalistic designs (Murrie, Boccaccini, Guarnera, & Rufino, 2013), and from analyses of Canadian legal cases in which PCL measures have been used (Edens, Cox, Smith, DeMatteo, & Sörman, 2015)-with the reliability figure for Canada (.59) somewhat higher in U.S. jurisdictions but still well below levels considered adequate for research. Similarly, reliability figures for PCL-R assessments conducted by state experts with homicide offenders in Sweden (.70 for PCL-R total, .62 for Factor 1, .76 for Factor 2; Sturup et al., 2014) were higher than counterpart U.S. figures, but again below research standards.

How does this lower score reliability impact predictive validity? Surprisingly, Boccaccini and colleagues (2012) reported that despite poor agreement between state and defense experts, their PCL-R ratings were each reasonably predictive of future misconduct (AUCs in the .70s). This suggests that despite disagreement, rank orders may be similar regardless of side. Murrie, Boccaccini, Caperton, and Rufino (2012) evaluated predictive validity of the PCL-R in a sample of 333 sex offenders who had been subjected to sexually violent predator (SVP) hearings but were not committed as such. Across the sample as a whole, neither the PCL-R nor its facets were predictive of subsequent violent or sexual recidivism. However, for cases rated by a subset of four "prolific evaluators" who had conducted more than 38 PCL-R evaluations each (and together accounted for 63.1% of the sample assessments), Factor 2 of the PCL-R was moderately predictive of violence and violence + sexual recidivism. For the remaining cases rated by evaluators who had conducted fewer evaluations, the PCL-R was not predictive.

# Generalizability across Settings and Samples

In the previous section, we reviewed meta-analytic evidence for the ability of psychopathy to predict criminal recidivism and discussed methodological factors that might influence the association. Given the heterogeneity observed in meta-analyses, we next evaluate the extent to which the predictive utility of psychopathy does or does not generalize across the many important contexts in which it has been studied.

The literature on psychopathy, crime, and violence is vast; thus, findings discussed in the following subsections are intended to be illustrative rather than exhaustive. In our view, the best available evidence regarding the strength of association between psychopathy and recidivism comes from meta-analyses. Some meta-analyses have found that setting (civil/forensic psychiatry patients vs. offenders) does not moderate the effect size of the psychopathy–recidivism association (Singh et al., 2011), whereas others have found that it does (e.g., Leistico et al. [2008] reported stronger effect sizes for Factor 2 of the PCL-R in patients vs. offenders). It is fair to state that in the "typical" settings (offenders, forensic patients, civil psychiatric patients) in which the PCL-R is used, there is support for a moderate-level association between psychopathy and recidivism, which is subject to moderating influences of differing types, as reported in meta-analyses. In the version of this chapter in the previous edition, we devoted considerable space to summarizing results from primary studies within settings of these types. Here, we allocate more space to reviewing findings from other settings and samples (i.e., community settings, institutional settings; perpetrators of sexual violence and intimate partner violence, intellectually disabled individuals; youth and women as compared to men; and differing racial/ethnic/national subgroups), and refer readers to our previous chapter and other, more recent reviews (Douglas, Nikolova, Kelley, & Edens, 2015) for detailed summaries of data findings in primary studies conducted in correctional, forensic, and civil psychiatric settings.

#### **Community Settings**

There is not a great deal of research on psychopathy and future violence or general crime within community settings. Coid, Yang, Ullrich, Roberts, and Hare (2009) administered the Psychopathy Checklist: Screening Version (PCL:SV; Hart, Cox, & Hare, 1995) to a national sample of 638 sixteen- to 74-year-olds in England, Wales, and Scotland. While finding a low base rate (0.6%) of individuals meeting the PCL:SV's cutoff for "possible psychopathy" (13/24), they reported strong associations between the PCL:SV and *past* indices of crime and violence. Coid and Yang (2011) reported similar findings. However, the postdictive nature of this research makes it vulnerable to criterion contamination, as we discussed earlier.

Research with self-report measures such as the PPI-R—much of which has been conducted with university (i.e., "community") samples—has, as reported earlier (Miller & Lynam, 2012), tended to show a link between psychopathic behavioral features and aggression or antisocial behavior, but a smaller or null relationship for affective or interpersonal features. And, as pointed out earlier, much of this research is cross-sectional or postdictive, decreasing its relevance to recidivism prediction per se.

Using another self-report measure, the Self-Report Psychopathy scale (SRP-III), Vitacco, Neumann, and Pardini (2014) found that psychopathy total and subscale scores were predictive of future violence charges over a 3-year follow-up period in a sample of 417 participants from the Pittsburgh Youth Study, who were age 25 at the time of the psychopathy assessment. AUC values were small (low .60s), but in regression analyses, the SRP-III was predictive of future violence charges after accounting for important covariates (i.e., demographics, past offending, substance use, peer delinquency). This is one of the few studies involving a community sample of adults that has shown prediction of future formal charges for crime based on a psychopathy measure. Lynam, Miller, Vachon, Loeber, and Stouthamer-Loeber (2009) reported similar findings for the Childhood Psychopathy Scale in this same community sample.

# Sexual Offending and Sexual Deviance

With regard to sexual offenders, the balance of available research suggests that (1) psychopathy predicts the nonsexual violence and general criminality of such offenders (Gretton, McBride, Hare, O'Shaughnessy, & Kumka, 2001; Hildebrand, de Ruiter, & de Vogel, 2004; Quinsey, Rice, & Harris, 1995), and (2) some types of sex offenses are less strongly related to psychopathy than others. Primary studies are divided in terms of whether psychopathy predicts sexual recidivism, with several reporting a significant predictive effect (Firestone, Bradford, Greenberg, & Serran, 2000; Hanson & Harris, 2000; Kingston, Firestone, Wexler, & Bradford, 2008; Quinsey et al., 1995) and others not, despite finding predictive effects for violent or general recidivism (Barbaree, Seto, Langton, & Peacock, 2001; Hildebrand et al., 2004; Långström & Grann, 2000; Viljoen, Elkovitch, Scalora, & Ullman, 2009). Sex offenses involving physical force and violence-such as rape-are more strongly related to psychopathy than offenses such as incest, and perpetrators of more than one type of sexual crime are more likely to be psychopathic (Porter et al., 2000).

Several meta-analyses have included or focused on psychopathy measures as predictors of sexual offending or sexual deviance, and these have revealed generally weaker predictive effects than those found for violent and nonviolent offending (Hemphill, Templeman, et al., 1998; Olver, Stockdale, & Wormith, 2009). More recently, Hawes, Boccaccini, and Murrie (2013) meta-analyzed studies examining links between the PCL-R and sexual violence, along with studies examining whether the PCL-R interacts with sexual deviance to predict future sexual violence. Across 20 studies, there was a small to moderate effect size (d = 0.40) for the relationship between PCL-R total scores and sexual recidivism, which was larger than that reported in a previous meta-analysis on the same topic (Hanson & Morton-Bourgon, 2005). As with other meta-analyses, the antisocial behavior features of the PCL-R (Factor 2; Facet 4) were more strongly related to sexual recidivism (d's = 0.44 and 0.40, respectively) than were its interpersonal, affective, or impulsive lifestyle features (d's = 0.01 to 0.17). In a small subset of six studies that investigated the interplay between the PCL-R and sexual deviance, an interaction effect was found, indicating greatly amplified risk of violent sexual recidivism among individuals scoring high on both the PCL-R and measures of sexual deviance.

#### Intimate Partner Violence

Studies of the role of psychopathy in intimate partner violence (IPV) have increased in the last 10 years. Holtzworth-Munroe and Stuart (1994) conceptualized three types of domestic batterers, one of which was thought to be more violent than the other types, namely, the Generalized Violence/ Antisocial batterer. The description of this batterer type includes several characteristics similar to psychopathy. Yet a study of males in treatment for domestic violence indicated that PCL:SV scores did not distinguish men of this type from the others (Family-Only, Borderline/Dysphoric; Huss & Langhinrichsen-Rohling, 2006). Other research, however, has reported evidence for an association between overall PCL-R scores and IPV (Grann & Wedin, 2001).

Conceptually, the two main factors of psychopathy might be expected to show opposing relations with some types of partner violence. Primary (affective-interpersonal) deficits might ironically protect against this type of aggression because of an absence of normal affectional ties, whereas the antisocial deviance component, which includes items reflecting impulsiveness and reactive aggression, would be expected to positively predict IPV. Studies of men in a correctional facility with a history of IPV (Hilton, Harris, Rice, Houghton, & Eke, 2008) or enrolled in treatment for domestic violence (Rock, Sellbom, Ben-Porath, & Salekin, 2013) have generally shown this to be the case. Total PCL-R scores and/or scores on the impulsive-antisocial (Factor 2) features significantly predicted continued domestic violence, whereas the interpersonal and affective features did not. Alternatively, one study of individuals in a substance abuse treatment with a history of IPV reported that PCL:SV Factor 1 scores were associated with increased retrospective reports of perpetrating IPV, but more so for men than women (Mager, Bresin, & Verona, 2014). The impulsive– antisocial features predicted histories of IPV in this study for both genders.

In summary, available findings suggest that antisocial and impulsive characteristics increase the likelihood of IPV, but that the features most indicative of a psychopathic disorder may not. A meaningful limitation is that in studies conducted to date, the samples of domestic batters have generally included relatively low levels of psychopathy. For example, the mean PCL-R score in Hilton and colleagues (2008) was 8, and the mean PCL:SV score in the Huss and Langhrinrichsen-Rohling (2006) study was approximately 5.5. In a retrospective study that examined psychopathy more diagnostically, Hervé, Vincent, Kropp, and Hare (2001) reported that inmates scoring high on the PCL-R were more likely than other inmates to have at least one documented incident of spousal violence; however, most high-psychopathic participants in this study did not have reported histories of spousal violence.

#### Intellectual Disability

A small number of studies have evaluated whether the PCL-R predicts violence among persons with intellectual disability (ID) (Gray, Fitzgerald, Taylor, MacCulloch, & Snowden, 2007). In a sample of 145 persons with mental disorders and ID, the PCL:SV total score was robustly associated with violent recidivism (AUC = .73) over a 5-year follow-up. The factor scores were less strongly predictive (AUCs = .63–.66). The PCL:SV and its factors were somewhat more predictive of general offending postrelease (AUCs = .68–.76). By contrast, Morrissey and colleagues (2007) reported that a modified PCL-R was only weakly associated with inpatient forensic violence in a sample of patients with ID.

#### Institutional Settings

In the aforementioned meta-analysis of relations between PCL measures and antisocial outcomes, Leistico and colleagues (2008) reported no differences in effect sizes for community as compared

to institutional violence or offending. Nonetheless, there may be variability within institutional settings. Examination of the utility of psychopathy in institutional settings is critical in order to gauge the absolute and relative utility of the PCL measures in environments where there may be fewer opportunities to act out, such as controlled institutional settings. In a narrative review focused on the application of the PCL-R to death penalty litigation, Edens, Petrila, and Buffington-Vollum (2001) concluded that PCL-R scores were generally associated with various forms of institutional misconduct, but that the relationship with violent acts appeared much more modest, particularly among U.S. samples; hence, use of the PCL-R in death penalty litigation (to address a person's likelihood of committing future criminal violent acts) was questionable (also see Edens et al., 2005, for a similar conclusion based on additional studies conducted in the United States).

Walters (2003a, 2003b) published two metaanalyses bearing on these issues. In the first of these, he reported a moderate association (r = .27)across 14 studies between PCL-R total scores and a broad "institutional adjustment" criterion measure (Walters, 2003a); however, analyses specific to violent misconduct were not reported. In subsequent work aggregating effects from seven analyses of the PCL-R, Walters (2003b) reported that PCL-R Factor 1 correlated only modestly with nonviolent misconduct (r = .14), whereas Factor 2 correlated somewhat more strongly (r = .21). Aggregating across 14 effects related to "violent" infractions (e.g., verbal aggression, hostility, destruction of property, fighting, assault), Walters reported mean correlations of .12 and .22 for Factors 1 and 2, respectively. Notably, Walters identified significant heterogeneity in the magnitude of these effects and examined several moderators in an attempt to explain this variability but was unable to identify any variables that accounted for the diversity of the effects. In summary, the predictive utility of psychopathy within institutions appears comparable to that in community studies, especially for broad categories such as "institutional infractions." However, its relationship to violent infractions might be weaker, especially within U.S. institutions.

The finding of weaker effects in U.S. institutional settings compared to non-U.S. settings was also observed in a meta-analysis by Guy, Edens, Anthony, and Douglas (2005). Focusing on 38 independent samples that used the PCL-R, effect sizes (r) for total, Factor 1, and Factor 2 scores with any institutional infractions were .29, .21, and .27, respectively. Effect sizes were substantially smaller (.17, .14, and .15, respectively) for physical violence. Furthermore, effect sizes were much smaller for U.S. studies: *r*'s for PCL-R total scores with physical violence were .11 in U.S. prisons compared to .23 in prisons outside the United States.

#### Gender

Commentators have queried whether psychopathy might manifest itself differently across genders as a function of influences including differential socialization (for summaries, see Cale & Lilienfeld, 2002; Verona & Vitale, Chapter 21, this volume). Some construct validity studies suggest that psychopathy measures capture an underlying disorder in women similar to that in men (Cale & Lilienfeld, 2002; Jackson, Rogers, Neumann, & Lambert, 2002; Skeem, Mulvey, & Grisso, 2003), although some unexpected divergences have been noted (Vitale, Smith, Brinkley, & Newman, 2002). Kreis and Cooke (2011) suggested a prototypical model of psychopathy among women, with females being more manipulative and emotionally labile, with a more unstable self-concept. They may also be less aggressive and generally more anxious. With respect to risk assessment, there are gender differences in the development and phenomenology of aggression that may interfere with the effectiveness of psychopathy measures as predictors of violent offending. In particular, women tend to engage more in "relational aggression," defined as indirect forms of subterfuge within the context of interpersonal relationships, whereas men tend to act in a more physically aggressive manner (Crick & Grotpeter, 1995).

There is more evidence now regarding gender as a moderator of the relationship between psychopathy and recidivism than when the first edition of this handbook was published. Previously, we had concluded that the available evidence was too thin and too inconsistent to draw conclusions. Two earlier meta-analyses had reported that, on average, PCL-R Factor 2 was more predictive of reoffending than Factor 1 for both sexes, with no mean gender differences in prognostic effectiveness of the PCL-R evident across studies (Guy et al., 2005; Walters, 2003a). A subsequent meta-analysis of 21 Psychopathy Checklist: Youth Version (PCL:YV) studies examining community recidivism indicated higher effect sizes for samples that included fewer females (Edens, Campbell, & Weir, 2007). More recently, Blais, Solodukhin, and Forth (2014) reported no moderating effect of gender in a meta-analysis of 53 studies investigating psychopathy and reactive versus instrumental violence. However, in the largest meta-analysis to date of studies using PCL measures (Leistico et al., 2008), higher effect sizes were evident for samples containing a higher proportion of females. Similarly, in a meta-analysis of 60 youth samples, Asscher and colleagues (2011) reported that femaleonly and mixed-gender samples had higher effect sizes than male-only samples. This is consistent with Yang and colleagues' (2010) meta-analysis of PCL measures and multiple risk assessment measures, in which effect sizes were larger for female-only and mixed-gender samples in general. However, for the PCL-R, effect sizes were larger for female and mixed samples compared to male-only samples for Factor 1 only. By contrast, in a metaanalysis that included the PCL-R and multiple risk measures, Singh and colleagues (2011) did not find gender to be a significant moderator of effect sizes, although effects trended toward being larger for samples containing a greater proportion of women than men.

As such, based on meta-analyses, psychopathy (assessed using PCL measures in most studies) appears to be comparably associated with future crime and violence for females and males, and in fact may be somewhat more strongly related to these outcomes for females. Nonetheless, metaanalyses may gloss over important findings at the individual-study level, and should rarely, if ever, be considered the final word on a given topic (Schmidt, 2013). It is still possible, and even likely, that psychopathy manifests differently in women than in men, as mentioned earlier. For example, highly psychopathic females may exhibit different forms of aggression than highly psychopathic men. However, there do not appear to be salient differences between genders in the rather basic association between current measures of psychopathy and future crime and violence.

In terms of illustrative individual studies, for a sample of 1,396 male and 321 female prisoners followed in England and Wales for 2 years, Coid, Yang, Ullrich, Zhang, and colleagues (2009) reported that the PCL-R predicted violent recidivism more strongly for women than for men (AUCs .65–.73 for women, .54–.68 for men). In line with this, Loucks and Zamble (2000) reported a strong relationship (r = .45; d = 0.82) between PCL-R scores and general recidivism among 81 female offenders. Nicholls, Ogloff, and Douglas (2004) found that the PCL:SV was more predictive of inpatient aggression and community violent criminal recidivism for female than male psychiatric patients. Douglas, Strand, Belfrage, Fransson, and Levander (2005) reported similar findings for forensic inpatient violence. Richards and colleagues (2003) reported that Factor 1 was more predictive of inpatient violence among female offenders during a pretreatment phase, but Factor 2 was more predictive during an "in-program" phase.

However, other studies have reported contrasting findings. In two prospective studies, Salekin and colleagues (1996; Salekin, Rogers, Ustad, & Sewell, 1998) found that the accuracy of the PCL-R for classifying women as recidivists versus nonrecidivists was "moderate to poor." In a sample of 147 adolescents referred for substance use treatment, Hemphälä and Hodgins (2014) found that Facet 4 was predictive of subsequent violent and nonviolent recidivism, but much more so for males than for females.

In summary, although meta-analytic evidence suggests comparability in predictive strength of psychopathy across males and females, if not slightly stronger prediction for females, some contrary findings are evident in the literature. As such, and given that most research on psychopathy is still conducted with males, this topic remains ripe for investigation. In particular, the interplay of gender with race, ethnicity, and age has been underexplored.

# Race, Ethnicity, and Country of Study

Cross-cultural research and theory hold that societal and contextual forces can shape the manifestation of symptoms of mental or personality disorder across cultures or ethnicities (Berry, Poortinga, Segall, & Dasen, 1992; Robins, Tipp, & Przybeck, 1991). There have now been multiple item response theory (IRT) and confirmatory factor analysis (CFA) studies across ethnicity, race, and country (see Fanti, Lordos, Sullivan, & Kosson, Chapter 22, this volume) that suggest comparable functioning of the PCL-R across ethnicity and race, at least at the test level (Cooke, Kosson, & Michie, 2001). Cooke, Michie, Hart, and Clark (2005) reported configural equivalence for the three-factor model of the PCL-R across North American and European samples but found evidence for differential item functioning, particularly with the lifestyle items. They suggested that affective and interpersonal features represent a "pancultural" core of psychopathy. In other work

using the PCL-R, Kosson and colleagues (2013) reported configural equivalence of the three- and four-factor models across North American and European female adolescents. For the PCL:SV, Jackson, Neumann, and Vitacco (2007) reported configural invariance of the four-factor model across ethnicities in U.S. civil psychiatric patients, and Skeem, Mulvey, and Grisso (2003) reported invariance for the three-factor model. Olver, Neumann, Wong, and Hare (2013) similarly reported invariance across the four-factor PCL-R model across white and Aboriginal Canadian offenders. However, the affective and antisocial facets were not invariant across German and North American offenders (Mokros et al., 2011). Studies to date using the newer Comprehensive Assessment of Psychopathic Personality (CAPP) inventory have generally found consistency for overall prototypicality ratings across cultures (see Douglas et al., 2015, for a review).

Focusing on predictive validity across countries, meta-analyses are again informative. As mentioned previously, for some forms of institutional misconduct, U.S. samples have yielded substantially lower validity coefficients than non-U.S. samples. In Guy and colleagues' (2005) metaanalysis, the mean weighted r for the "general infraction" category was .13 for U.S. studies (k =6) versus .35 for non-U.S. samples (k = 11). It was considerably smaller for prediction of violent infractions as well within U.S. settings. In the Leistico and colleagues (2008) meta-analysis of PCL measures, U.S. studies produced smaller effects than Canadian or European studies. Asscher and colleagues (2011) likewise reported higher effect sizes for psychopathy measures among Canadian youth relative to those from the United States or Europe. The same finding held in Blais and colleagues' (2014) meta-analysis of reactive versus instrumental violence. Notably, these results coincide with evidence from meta-analyses of risk assessment methods more broadly demonstrating stronger predictive effects in Canada relative to the United States (Singh et al., 2011; Yang et al., 2010). Reasons for these differences are unclear, but contributing factors may include tighter security or greater ethnic/racial heterogeneity in some U.S. institutions (e.g., Hicks, Rogers, & Cashel, 2000), poorer quality and quantity of file information in the United States, and a less well-integrated national criminal record system in the United States compared to other countries-with the latter two factors in particular hampering methodological quality of research.

In terms of ethnicity and race, Leistico and colleagues (2008) reported that effect sizes for both PCL total and Factor 2 scores were stronger when there was a greater proportion of European American participants in samples. Similarly, Asscher and colleagues (2011) reported greater effect sizes for youth measures of psychopathic traits when the proportion of immigrants was lower in samples. Similarly, Blais and colleagues' (2014) meta-analysis reported lower effect sizes when ethnic diversity was higher.

Unfortunately, most predictive studies-whether conducted in the United States, Canada, Europe, or elsewhere-tend not to report predictive statistics separately by race, nor do they examine race as a moderating factor or covariate, even when numbers permit. Several studies have tested for ethnicity-related differences in indices of past criminal behavior, with most reporting minimal or no differences (Cornell et al., 1996; Kosson, Cyterski, Steuerwald, Neumann, & Walker-Matthews, 2002; Kosson, Smith, & Newman, 1990; but see Brinkley, Schmitt, Smith, & Newman, 2001). Studies examining moderating effects of ethnicity on prospective prediction of offending behavior are less common. In one such study, Heilbrun and colleagues (1998) reported weak effects for the PCL in predicting institutional and community violence among forensic patients, and found that race itself was not significantly predictive of violence, nor did it moderate the relationship between psychopathy and violence. Using data from the MacArthur Violence Risk Assessment project (Monahan et al., 2001), Vitacco, Neumann, and Jackson (2005) reported that minority race (primarily African American) was correlated modestly but significantly (r's = .15–.20) with overall scores on the PCL:SV. However, both the threeand four-factor models of the PCL:SV were predictive of violence in structural equation modeling with ethnicity controlled, suggesting that the PCL:SV was predictive of violence regardless of ethnicity. The four-factor model was more strongly predictive of violence than the three-factor model.

Within the Pittsburgh Youth Study sample (Huizinga, Loeber, & Thornberry, 1993), little evidence was found for effects of race on relations between psychopathy scores and delinquency or other conceptually relevant outcomes (Vachon, Lynam, Loeber, & Stouthamer-Loeber, 2012). Schmidt, McKinnon, Chattha, and Brownlee (2006) reported comparable effect sizes for the PCL:YV in predicting violent and general recidivism across male subsamples of white and Aboriginal young offenders from Canada, but found some differences between white and Aboriginal female subsamples wherein the PCL:YV was not predictive for female Aboriginals. In a different Canadian sample of 161 young offenders, Stockdale, Olver, and Wong (2010) reported that white and Aboriginal subgroups showed comparable predictive associations between PCL:YV ratings and offending during adolescence and adulthood (strong during adolescence, weak during adulthood).

Walsh (2013) compared prospective prediction of violent offense behavior using the PCL-R across groups consisting of European American, African American, and Latino American offenders (n's = 166, 174, and 85, respectively) over a 66-month follow-up period. He reported that the PCL-R was most strongly predictive of postrelease violence in the European American group, and found a formal moderation effect for European versus non-European offenders, with effect sizes higher for European Americans. Interestingly, in an earlier study, Walsh and Kosson (2007) reported that whereas the PCL-R's predictive validity was stable across levels of socioeconomic status (SES) for African American offenders, it was weaker for lower-SES European American offenders compared to higher-SES European American offenders.

By contrast, Hicks and colleagues (2000) reported that the PCL:SV was substantially *more* accurate in predicting institutional violent and nonviolent infractions among adolescent African Americans compared to European Americans or Hispanics, although the sample sizes of these racial/ethnic groups were relatively small. Similarly, Vitacco, Neumann, and Caldwell (2010) reported stronger predictive relations for the PCL:YV (the Antisocial Facet, in particular) with general reoffending over a 5-year follow-up in African American compared to European American male young offenders.

In summary, meta-analyses of available research data have revealed generally weaker predictive validity for psychopathy measures within the United States relative to other countries (especially Canada), and weaker prediction in studies that include a higher proportion of ethnic or racial minority participants. However, the picture is not entirely clear. Few studies have *formally* evaluated whether ethnicity or race moderates the psychopathy–recidivism link—using statistical tests for moderation (e.g., Judd, Kenny, & McClelland, 2001; Preacher, Zhang, & Zyphur, 2016). Of studies that have, some have failed to find a moderating effect, whereas others have indeed observed such effects, with at least one study reporting higher predictive validity for African Americans relative to European American or Latino participants (Vitacco et al., 2010). As with gender, this topic remains ripe for investigation.

#### **Children and Adolescents**

A considerable number of studies over the past decade have examined the utility of psychopathic traits for predicting offense behavior among children and adolescents using the Hare Psychopathy Checklist: Youth Version (PCL:YV; Forth, Kosson, & Hare, 2003) or other assessment tools designed for young people (e.g., the Antisocial Process Screening Device [APSD]; Frick & Hare, 2001).<sup>1</sup> Similar to research with adults, there is appreciable evidence that delinquents who score high on the PCL:YV exhibit a distinct and severe pattern of offending. High PCL:YV scorers are most likely to have histories of frequent and violent offending and begin at a younger age than other offenders (Brandt, Wallace, Patrick, & Curtin, 1997; Corrado, Vincent, Hart, & Cohen, 2004; Toupin, Mercier, Dery, Cote, & Hodgins, 1996). Studies using both the PCL:YV (Hicks et al., 2000) and the selfreport version of the APSD (APSD-SR; Muñoz & Frick, 2007) have found that high scorers show severe patterns of institutional misconduct, violence, and program noncompliance (Falkenbach, Poythress, & Heide, 2003; Murrie, Cornell, Kaplan, McConville, & Levy-Elkon, 2004). In studies of children ages 6–13, the presence of non-normative levels of callous-unemotional (CU) traits predicts a severe, stable, and aggressive pattern of behavior among youth showing severe early conduct problems (Kahn, Frick, Youngstrom, Findling, & Youngstrom, 2012; McMahon, Witkiewitz, Kotler, & Conduct Problems Prevention Research Group, 2010). Indeed, in McMahon and colleagues' (2010) study, a significant predictive effect was evident for psychopathic features assessed in seventh grade with antisocial outcomes measured 2 years following high school.

Results for prediction of delinquent behavior, recidivism, or violence vary depending on the psychopathy inventory used, with the PCL:YV being the most common. A meta-analysis by Edens and colleagues (2007) of prediction based on PCL:YV total scores yielded moderate effect sizes (mean weighted r = .26) for general recidivism across 20 separate samples, and for violent recidivism (r = .23) across 14 samples. The average follow-up period across studies included in this meta-analysis

was 32 months, with the longest being 10 years. Analyses for the two broad factors of the PCL:YV indicated that Factor 2 scores were more strongly related to general and violent recidivism than Factor 1 scores—consistent with meta-analytic findings for adults (Yang et al., 2010). In an updated meta-analysis of 28 recidivism studies, Olver and colleagues (2009) reported moderate effect sizes for the PCL:YV in predicting general (mean weighted r = .28) and violent (r = .25) recidivism, comparable to predictive effects for the Youth Level of Service/Case Management Inventory. Research to date also indicates that high PCL:YV scorers tend to reoffend sooner after release from an institution than other adolescent offenders (Corrado et al., 2004; Gretton et al., 2001). Relative to predictive effects for the PCL:YV, findings for self-report measures of adolescent psychopathy have been mixed (e.g., Boccaccini et al., 2007; Cauffman, Kimonis, Dmitrieva, & Monahan, 2009; Colins, Vermeiren, De Bolle, & Broekaert, 2012).

Outcome data for most studies included in the previously mentioned meta-analyses have been limited to official reoffense records, which may underestimate the rate of recidivism. More recently, a meta-analysis by Asscher and colleagues (2011) of 60 samples spanning ages 9-18 years expanded prior work by including studies that (1) used any child or adolescent psychopathy measure, (2) were either cross-sectional or longitudinal, and (3) utilized either self-reported delinquency data (from community samples) or official records of recidivism (from offender samples). Aggregate results indicated that psychopathy scores moderately predicted self- or informant-reported acts of delinquency (r = .23), official records of general recidivism (r = .21), and official records of violent recidivism (r = .22). Effect sizes varied considerably, however. For example, predictive effects for clinical assessments of psychopathy (e.g., APSD informant scales, PCL:YV) were significantly stronger than those for self-report measures. This was especially true when predicting general recidivism, where the mean effect size for the PCL:YV was .25 as compared to .12 for self-report measures (e.g., APSD-SR and Youth Psychopathic Traits Inventory [YPI]; Andershed, Gustafson, Kerr, & Stattin, 2002). Effect sizes were also larger for outcomes based on self- or informant-report as compared to official records.

Numerous researchers using the PCL:YV have reported moderate effect sizes for prediction of reoffending, and in Leistico and colleagues' (2008) meta-analysis, neither age nor version of PCL

(youth vs. adult) moderated predictive validity. However, aside from the PCL:YV and the APSD informant scales for children, little support exists for the utility of any other psychopathy measures for indexing risk of reoffending in young people. Furthermore, despite the positive results for the PCL:YV, several cautions are warranted in interpreting findings from research using this measure. First, according to published meta-analyses and other individual studies (e.g., Vincent, Odgers, McCormick, & Corrado, 2008), there is minimal evidence to suggest that the PCL:YV predicts reoffending effectively in samples of girls. An exception may be the meta-analysis by Asscher and colleagues (2011), which found that gender did not moderate the relation between psychopathy and reoffending; however, the moderating effect did approach significance across differing psychopathy measures and was not evaluated separately for the PCL:YV. Second, juvenile psychopathy measures rarely have been scrutinized rigorously enough to consider whether they provide incremental validity over other youth violence-risk indicators (e.g., age of onset, number of prior offenses). Among studies that have examined this issue, some indicate no incremental validity for the PCL:YV beyond variables such as past offending, substance use problems, or other historic behaviors (Douglas, Epstein, & Poythress, 2008; Viljoen et al., 2009), whereas others have reported incremental validity (Schmidt, Campbell, & Houlding, 2011).

Third, most studies and meta-analyses involving adolescents have reported results separately for PCL:YV factor or facet scores, as opposed to examining psychopathy as a "syndrome" encompassing all symptom clusters, which may be a more powerful predictor. Vincent, Vitacco, Grisso, and Corrado (2003), for example, found that a cluster of adolescent offenders scoring high on all factors of the PCL:YV (Interpersonal, Affective, and Lifestyle-Behavioral) were much more likely to recidivate violently (50%), and did so sooner after release (average 14 months), than adolescents scoring high on behavioral features alone (27% recidivated after an average of 18 months). Studies conducted with child samples support the utility of this approach by consistently finding that the combination of conduct problem (CP) and CU traits is associated with a very different pattern of aggression and offending than either symptom cluster alone.

Finally, most studies of recidivism in youth have spanned follow-up periods of 1 to 3 years and have rarely tracked reoffending into later adulthood. In work by Cauffman and colleagues (2009), the PCL:YV was predictive of self-report aggression and formal recidivism in the short term (6 and 12 months), but not over 3 years postassessment. Stockdale and colleagues (2010) similarly reported good predictive validity of the PCL:YV when participants were still adolescents, but not when they were adults. Edens and Cahill (2007) similarly found the PCL:YV to be ineffective in predicting recidivism among adolescents followed into young adulthood.

However, there are exceptions to these null findings. For example, in a 12-year follow-up study of 126 juveniles (mean age ~15 years), Dyck, Campbell, Schmidt, and Wershler (2013) found that PCL:YV total scores and scores for all but the Interpersonal facet were correlated with increased numbers of violent and other types of convictions into young adulthood (age 23). There was a general decline in reconvictions into young adulthood for all youth regardless of PCL:YV score, indicating that all young offenders displayed a higher level of criminal activity during adolescence than in adulthood. Similarly, Gretton and colleagues (2001) reported that PCL:YV scores among young sex offenders were predictive of recidivism into adulthood. In another study of participants assessed for psychopathy in midadolescence (Hemphälä & Hodgins, 2014), the antisocial facet of the PCL:YV was predictive of criminal behavior 5 years later. Additionally, Salekin (2008) reported predictive effects for three different measures of psychopathy in an adolescent sample across 3-4 years, and Schmidt and colleagues (2011) found the PCL:YV to be a strong predictor of recidivism (among males more so than females) in a 10-year follow-up study of adolescents. Using the Childhood Psychopathy Scale to index psychopathy, Lynam and colleagues (2009) reported that psychopathic tendencies predicted adult violence in a sample of youth assessed at age 13.

# Incremental Validity of Measures of Psychopathy

There can be little argument that psychopathy, and specifically Factor 2 of the PCL-R, predicts both violent and general recidivism, broadly speaking, with moderate effect sizes. Less clear is whether there is anything unique about the predictive utility of psychopathy once other risk factors, or indeed entire risk assessment instruments, are taken into account. Furthermore, given the varying predictive strength of differing symptom components of psychopathy (behavioral vs. interpersonal–affective), it makes sense to evaluate whether different features of psychopathy show incremental validity over others.

#### **Risk Factors**

Early reviews (Hemphill, Templeman, et al., 1998) and individual studies (Tengstrom, Hodgins, Grann, Langstrom, & Kullgren, 2004) have supported the incremental validity of the PCL-R relative to other predictors of recidivism, such as demographics, substance use, criminal history variables, and personality disorder diagnoses. Cauffman and colleagues (2009) reported incremental validity for the PCL:YV and the Youth Psychopathic Traits Inventory (YPI) beyond past offending and demographics, at least for short-term violence and offending. Salekin (2008) reported predictive effects in a sample of young offenders for multiple psychopathy measures even when controlling for 14 relevant risk factors. However, Douglas and colleagues (2008) and Walters (2009) failed to find incremental validity for the PCL:YV.

Skeem and Mulvey (2001) conducted a thorough test of the incremental validity of the PCL:SV using data from Monahan and colleagues' (2001) MacArthur study. When they controlled for 15 established risk factors through propensity score analysis, the correlation between the PCL:SV and violence was reduced from .26 to .12. The authors characterized this as representing the "unique" predictive effect of psychopathy for violence. This clearly stringent test of incremental validity demonstrated that the PCL:SV retained at least some predictive utility even after the authors controlled for a large number of relevant covariates.

#### Risk Assessment Instruments

A number of published meta-analyses have examined measures of psychopathy alongside risk assessment measures, but in general they have not evaluated incremental validity of these measures against one another. In one meta-analysis that did so, Yang and colleagues (2010) found two measures to be significantly more strongly related to violent outcomes than the PCL-R: the HCR-20 and the OGRS. In another meta-analysis, Guy, Douglas, and Hendry (2010), formally tested the incremental validity of the HCR-20 and PCL-R in 34 samples that included both instruments, thus providing the most head-to-head comparisons to date of PCL measures with the HCR-20. At a bivariate level, AUCs for prediction of violent behavior were the same for the HCR-20 and PCL (.69 in each case). The authors also conducted multivariate analyses using raw data from seven samples, with removal of one psychopathy-specific item from the HCR-20. Across this set of studies, the HCR-20 (minus its psychopathy item) added incrementally to prediction over the PCL-R, whereas the PCL-R did not add incrementally to the HCR-20. With both instruments included in the meta-analytic model, the probability of a violent outcome increased 23% for every one-step increase on the HCR-20, whereas it *decreased* by 1% for every one-step increase on the PCL-R.

Similar findings—of risk assessment instruments contributing to prediction over psychopathy instruments and/or psychopathy measures not adding incrementally to risk instruments—have been reported in a number of primary studies beyond these meta-analyses (Looman, Morphett, & Abracen, 2013, for sexual recidivism; McDermott, Edens, Quanbeck, Busse, & Scott, 2008; Neves, Gonçalves, & Palma-Oliveira, 2011; Rettenberger & Eher, 2013; Viljoen et al., 2009; Welsh, Schmidt, McKinnon, Chattha, & Meyers, 2008), with a smaller number of studies reporting contrasting results (see Looman et al., 2013, for serious sexual or violent recidivism; see also Schmidt et al., 2011).

#### Characteristics of Psychopathy

Walters has reported on a series of studies, with differing samples, comparing Facet 4 (Antisocial) of the PCL measures to Facets 1 (Interpersonal), 2 (Affective), and 3 (Lifestyle) in predicting recidivism. In general, these studies indicate that Facet 4 adds incrementally to Facets 1–3, whereas the converse is not true (Walters, 2012; Walters & Heilbrun, 2010; Walters, Knight, Grann, & Dahle, 2008): In most cases, Facets 1–3, singly or as a composite, are nonsignificant in final models. Others have reported the Antisocial facet to be the only PCL facet exhibiting significant prediction in multivariate analyses (Cauffman et al., 2009; Vitacco et al., 2010; Wallinius, Nilsson, Hofvander, Anckarsätar, & Stålenheim, 2012), although some studies have found support for Facet 3 (Olver, Neumann, Wong, & Hare, 2013). Consistent with these results, in a meta-analysis, Kennealy, Skeem, Walters, and Camp (2010) examined data from 32 samples and focused on the two broad factors of the PCL-R and found Factor 2 to be more strongly related to violence than Factor 1 (d's = 0.40 and 0.11, respectively), with no incremental contribution for the interaction of the two factors beyond their main effects.

# Interactive Effects with Other Risk Factors

The interaction between psychopathy and other risk factors in predicting criminal behavior has not been an area of extensive research, although one particular topic has received a good deal of attention-namely, the possibility that high psychopathy scores combined with deviant sexual arousal may portend a significantly elevated risk for sexual reoffending among convicted rapists. In an initial study, Rice and Harris (1997) reported that phallometric measures of sexual deviance and psychopathy were both modestly correlated with sexual recidivism in a sample of 288 Canadian sex offenders followed for an average of 10 years, but the interaction of these two variables was much more prognostic of increased violence risk: Approximately 70% of sex offenders in this study who exhibited elevated PCL scores in conjunction with deviant sexual arousal were convicted of a new sexual offense after release, compared to only 40% of other offenders. Results consistent with these were reported subsequently by Hildebrand and colleagues (2004). In contrast, Gretton and colleagues (2001) reported that the interaction between deviant sexual arousal and psychopathy scores was predictive of general and violent recidivism, but not sexual recidivism per se. However, participants in the Gretton and colleagues study were adolescents with prior histories of sexual offending, a group that is thought to differ dramatically from adults in their motivations for sex crimes (e.g., Hunter, Figueredo, Malamuth, & Becker, 2003; Pithers, Gray, Busconi, & Houchens, 1998). In line with findings from the studies by Rice and Harris and Hildebrand and colleagues, Hawes and colleagues (2013) reported, in their meta-analysis described earlier, that high rates of sexual recidivism were evident across six studies that evaluated the combination of PCL scores and sexual deviance.

Interaction effects have also been reported between psychopathy and other risk variables. For example, Beggs and Grace (2008) reported that intelligence and PCL-R psychopathy interacted in a sample of child molesters such that high psychopathy together with low intelligence was associated with higher levels of sexual recidivism. As another example, Tikkanen and colleagues (2011) reported that PCL-R scores interacted with the presence of the high-activity monoamine oxidase A (MAOA) genotype in predicting elevated risk for impulsive reconvictions in a sample of Finnish alcoholic offenders.

# Relevance of Theories and Models to the Psychopathy–Violence Relationship

The vast majority of research on psychopathy's prediction of recidivism is atheoretical-unless one considers psychopathy itself a "mini-theory" of violence, as some have (Steadman et al., 1994). Based on past theoretical writings, recent conceptual work has explored the possibility that different variants of psychopathic personality may exist (Hicks & Drislane, Chapter 13, this volume; Skeem, Poythress, Edens, Lilienfeld, & Cale, 2003). Skeem, Poythress, and colleagues (2003) reviewed several theories of psychopathy (e.g., Cleckley, 1941/1976; Fowles, 1980; Gray, 1987; Karpman, 1941; Mealey, 1995; Porter, 1996), along with recent cluster-analytic research in an attempt to discern trait dimensions along which so-called "primary" and "secondary" psychopaths might vary. Primary psychopaths, for example, are more likely to show true affective deficits (i.e., lack of conscience, lack of guilt), low trait anxiousness, and overt narcissism. Secondary psychopaths, though appearing to show affective deficits at times, do in fact have the capacity for social emotions. They are also more likely to be characterized by anxiety and negative emotionality, as well as traits consistent with borderline personality disorder (e.g., anger; impulsivity; primitive defense mechanisms such as splitting). Secondary psychopathy is thought to be acquired through environmental insult; parental abuse, rejection, or overindulgence; and other traumatic experiences (Porter, 1996). Primary psychopathy is thought to result from an innate lack of conscience.

A number of researchers now support this basic "primary" versus "secondary" distinction (Drislane et al., 2014; Kimonis, Skeem, Cauffman, & Dmitrieva, 2011; Poythress et al., 2010; Vaughn, Edens, Howard, & Smith, 2009; Wareham, Dembo, Poythress, Childs, & Schmeidler, 2009). Typically, the primary variant is characterized by high scores on interpersonal and affective dimensions (and possibly elevations on some behavioral features), along with lower scores on measures of anxiety and negative affectivity. Secondary psychopathy is typically marked by high scores on behavioral features, lower scores on affective–interpersonal features, and distinct elevations on measures of anxiety and negative affectivity.

The notion of differing phenotypic variants of psychopathy gives rise to hypotheses about alternative types of criminal, and violent behavior that might be associated with each. One would expect more instrumentality to be associated with interpersonal-affective features of psychopathy, and less angry-reactive violence in response to provocation or insult (Camp, Skeem, Barchard, Lilienfeld, & Poythress, 2013; Patrick & Zempolich, 1998; Skeem, Poythress, et al., 2003; Walsh, Swogger, & Kosson, 2009). Indeed, the Factor 1 component of the PCL-R and its affiliates tend to correlate more strongly with indices such as planning and material gain than Factor 2, and less strongly with emotional arousal (Cornell et al., 1996; Porter, Woodworth, & Black, Chapter 25, this volume; Williamson, Hare, & Wong, 1987). It might also be expected that some persons with high levels of "primary symptoms" would not show physical violence because they are able to meet their needs through manipulation rather than force. Alternatively, secondary psychopaths should be expected to be more aggressive and violent than primary psychopaths. In line with this, Hicks, Markon, Patrick, Krueger, and Newman (2004) found that high-anxious adult secondary variants-labeled "aggressive psychopaths"-had more extensive histories of violence and criminality and displayed greater aggression, reactive hostility, and impulsivity. In addition, Kimonis and colleagues (2011) reported in work with juvenile offenders that 92% of secondary variants committed institutional violence over a 2-year time period compared with 69.4% of primary variants.

These findings map onto the general observation that Factor 2 tends to be more strongly related to future crime and violence than Factor 1. However, Blais and colleagues (2014) reported in their meta-analysis that *both* Factor 1 and Factor 2 were associated with instrumental and reactive violence, although there was some evidence that interpersonal features were more strongly related to instrumental violence than other features of psychopathy. Moreover, a high proportion of the studies examined by Blais and colleagues were postdictive, allowing less firm conclusions to be drawn because of the potential for criterion contamination.

Closely related to this theoretical discussion is an ongoing debate regarding the centrality of antisocial and criminal behavior to psychopathy. Hare's (2003) position is that antisocial behavior defines part of the construct of psychopathy, and items relating to overt behavioral deviance are explicitly represented in his Facet 4 (Antisocial). On the other hand, Cooke and Michie (2001) excluded these items from their three-factor model on the grounds that they did not provide unique information about the underlying trait of psychopathy according to item response theory and confirmatory factor analyses, and subsequently, Cooke, Michie, Hart, and Clark (2004) conceptualized antisocial behaviors as consequences of psychopathy rather than as constituent traits among those that define the disorder. Skeem and Cooke (2010) have made similar arguments, with Hare and Neumann (2010) arguing in opposition that antisocial (as opposed to criminal) behavior is an important part of the construct of psychopathy.

This debate has some important implications for the recidivism and risk assessment field. Mounting evidence supports the behavioral, and in particular the antisocial, aspects of psychopathy as being predictive of crime and violence, whether measured by PCL instruments or other inventories. If antisocial behavior were excluded from the definition of psychopathy, then psychopathy would be expected to be less predictive of future crime or violence. This definitional issue is more important for the field of psychopathy than for the field of risk assessment, which can consider behaviors associated with the Antisocial facet of the PCL measures (or similar indicators in other instruments) whether they form part of a coherent construct or not.

The PCL measures' reliance on overt criminality and antisocial behavior to some extent spurred the development of alternative measures with less representation of crime and antisocial behavior, such as Lilienfeld's self-report PPI and PPI-R. Despite having scales that demarcate factors ostensibly similar to the PCL-R's interpersonal-affective and lifestyle-antisocial factors (FD and SCI, respectively), the items of the PPI are less strongly imbued with crime- and violence-specific content. Despite this, the pattern of associations for the PPI factors with recidivism parallel those for the PCL measures—with much stronger associations for its behavioral deviance (SCI) features than its interpersonal-affective (FD) features (see Marcus, Fulton, & Edens, 2013; Miller & Lynam, 2012).

The Comprehensive Assessment of Psychopathic Personality (CAPP; Cooke, Hart, Logan, & Michie, 2012), another relatively new model of psychopathy, is less reliant on overt criminality and antisociality. It contains six domains reflective of the authors' opinions about key areas of personality functioning—Attachment, Dominance, Behavioral, Cognitive, Self, and Emotional. The CAPP has received a good deal of support in terms of prototypicality ratings (see Douglas et al., 2015, for a review). Initial research provides evidence for a robust association between scores on the CAPP and violent recidivism (Pedersen, Kuz, Rasmussen, & Elsass, 2010).

A further conceptual development-the triarchic model of psychopathy (Patrick & Drislane, 2015; Patrick, Fowles, & Krueger, 2009)-parses psychopathy into Meanness, Disinhibition (akin to PPI-SCI), and Boldness (akin to PPI-FD). Although this model has generated considerable scholarly interest and activity, there has been little research to date on its relevance to future crime and violence. Boldness (when operationalized as PPI-FD) tends not to be strongly related to antisocial behavior (Marcus et al., 2013; Miller & Lynam, 2012), although in one study it was found to interact with disinhibitory tendencies (as indexed by PPI-SCI) to predict predatory aggression (Smith, Edens, & McDermott, 2013). Continued research on both the Triarchic Psychopathy Measure (TriPM) and CAPP models will certainly occupy a good deal of future research on psychopathy broadly, and on recidivism specifically.

# **Psychopathy and Risk Assessment**

There have been considerable developments since the first edition of this handbook with respect to the role of psychopathy within risk assessment. It is important to note at the outset that neither the PCL-R nor any other measure of psychopathy can be considered a risk assessment instrument in itself. They are instruments used to measure a personality-based clinical construct, and as such, were not designed specifically to predict crime or violence. In the risk assessment context, they index a single risk factor. As such, psychopathy instruments should never be used in isolation, without consideration of other risk factors, and where available and appropriate, comprehensive evidence-based risk assessment instruments. Having said that, an extreme score on the PCL-R may be sufficient for a determination of high risk (Hart, 1998), although perhaps not in some contexts, such as estimating risk of institutional violence among life-sentenced offenders (Edens, Petrila, & Buffington-Vollum, 2001).

Given its reputation as a robust (consistent) predictor of recidivism, it is not surprising that psychopathy—usually as measured by the PCL family of measures-plays a prominent role in contemporary (post-1990) risk assessment instruments. This is true of measures developed according to the "structured professional judgment" model of risk assessment (Douglas, Cox, & Webster, 1999; Guy, Packer, & Warnken, 2012)-such as the HCR-20 Version 2 (Webster et al., 1997), the Sexual Violence Risk-20 (SVR-20; Boer et al., 1997), and the Risk for Sexual Violence Protocol (RSVP; Hart et al., 2003)-which include psychopathy as an indicator because of its demonstrated predictive utility across multiple studies. Psychopathy has also been included in some actuarial risk assessment instruments (i.e., the VRAG; Harris, Rice, & Quinsey, 1993; Quinsey et al., 1998, 2006) because of its contribution to statistical-model-based prediction in one or more participant samples.

Of note, however, the most recent (third) version of the HCR-20 (Douglas et al., 2013) no longer *requires* the use of the PCL-R or PCL:SV. This decision stems from meta-analytic work (Guy et al., 2010; Yang et al., 2010) indicating that the predictive validity of the HCR-20 is not dependent on the PCL-R/PCL:SV, and in fact does just as well without it (Guy et al., 2010), and because new measures of psychopathy have been developed in recent years. Nonetheless, Version 3 of the HCR-20 still permits the use of the PCL-R/PCL:SV by evaluators who wish to use it.

How have psychopathy measures compared to measures designed specifically to assess risk? To some extent we have answered this question through our review of published meta-analytic findings in foregoing sections. Whereas early research suggested a slight advantage for the PCL measures (for a review, see Hemphill, Hare, & Wong, 1998), more recent meta-analytic studies comparing the PCL-R to contemporary risk assessment instruments have yielded different conclusions. For example, in Gendreau and colleagues' (2002; see also Gendreau, Goggin, & Smith, 2003) meta-analysis, the LSI-R outperformed PCL measures substantially in predicting general recidivism, and modestly in predicting violent recidivism. Hemphill and Hare (2004; see also Hare, 2003) sought to rebut these findings on methodological grounds, and reanalyzed most of the studies from Gendreau and colleagues' meta-analysis that directly compared the LSI and the PCL. Although their reanalysis yielded markedly different results regarding the relative superiority of the LSI, neither meta-analysis reported statistical tests of incremental validity for the two measures.

More recent meta-analyses have tended to show that the PCL measures do as well as, or worse than, risk assessment measures. In the meta-analysis by Yang and colleagues (2010), PCL measures were "in the middle of the pack," although Factor 1 scores performed significantly worse than full PCL scores and no better than chance. Both the HCR-20 and OGRS statistically outperformed the PCL-R/PCL:SV. In Campbell, French, and Gendreau's (2009) meta-analysis, no significant differences were evident between the PCL-R/PCL:SV and other instruments devised specifically for risk assessment. Guy and colleagues showed similar bivariate effect sizes for the PCL-R/PCL:SV and HCR-20, but when both measures were included together in a regression model, the PCL-R/ PCL:SV's predictive contribution dropped to near zero, whereas the HCR-20's contribution remained strong. In a direct comparison of multiple risk assessment instruments, Singh and colleagues (2011) and Fazel and colleagues (2012) reported that the PCL measures performed toward the bottom range compared to other instruments they evaluated (though typically still with moderate effect sizes), whereas instruments designed expressly to predict violence and specific forms of violent behavior fared better. In Olver and colleagues' (2009) metaanalysis, the PCL:YV showed lower coefficients for prediction of recidivism (r = .16 - .28) compared with the YLS/CMI (.26–.32) or SAVRY (.30–.38).

# Psychopathy and Violence Risk Management

There has been a decided conceptual movement in the risk assessment field toward increased focus on the reduction and management of future violence as the primary goal of risk assessment, rather than on mere prediction per se (Guy, Douglas, & Hart, 2015). In this regard, knowledge of psychopathic characteristics can be valuable for formulating a conceptual model of an individual's behavioral risk (i.e., for explicating causes of and motivations for past violence; see Douglas et al., 2013; Hart et al., 2003). Many commentators have also called for the inclusion of so-called "dynamic" or changeable risk factors within risk assessment protocols (Douglas & Skeem, 2005). Although we are in general agreement with this position, we believe that jettisoning "static" or (relatively) unchanging risk factors (which arguably includes psychopathy, at least among adults) from risk assessment would be a mistake given the extent of evidence supporting their predictive validity and importance for informing treatment and risk management strategies.

Effective treatment strategies for psychopathic individuals may require some modification of traditional approaches with violent offenders (Hemphill & Hart, 2003). Research has found that such individuals are more disruptive, less compliant, and more likely to drop out of treatment and other programming (Hildebrand & de Ruiter, 2012; Morrissey, Mooney, Hogue, Lindsay, & Taylor, 2007; Ogloff, Wong, & Greenwood, 1990). Although early research (Rice, Harris, & Cormier, 1992) engendered pessimism about prospects for reducing violence and crime among highly psychopathic individuals, discouraging results from this work may have stemmed more from the type of treatment administered than from the imperviousness of those receiving it (Polaschek & Skeem, Chapter 29, this volume). More recent research offers greater promise that, if highly psychopathic individuals receive greater doses of programming, they are just as likely as nonpsychopathic patients or offenders to benefit from it (e.g., Caldwell, Skeem, Salekin, & van Rybroek, 2006; Skeem, Monahan, & Mulvey, 2002; for a review, see Polaschek & Skeem, Chapter 29, this volume). This finding is consistent with the well-established and supported riskneed-responsivity model of correctional intervention (Andrews, 2012), which, inter alia, holds that higher-risk individuals need higher intensity or dosage of intervention or management.

Several more recent studies have shown that high psychopathy patients or offenders are able to demonstrate treatment-relevant change as a result of intervention (Chakhssi, de Ruiter, & Bernstein, 2010; Hildebrand & de Ruiter, 2012; Olver, Sewall, Sarty, Lewis, & Wong, 2015; Polaschek & Ross, 2010). Olver and colleagues (2015) demonstrated that those classified in a primary psychopathy group showed change in the course of correctional programming (though less change than the secondary psychopathy group), and this change was relate to reduced violent recidivism. In a randomized controlled trial of a reasoning and rehabilitation program, verbal (though not physical) aggression was decreased, even when researchers controlled for psychopathy. Olver, Lewis, and Wong (2013) showed that reductions on dynamic (treatment-relevant) risk factors during correctional treatment were associated with lower violent recidivism among highly psycho-
pathic male offenders. Olver and Wong (2009) similarly reported that treatment-relevant changes in a sample of psychopathic sexual offenders were associated with future reductions in recidivism.

There are special circumstances that arise in relation to psychopathy/risk management when the population of interest is youthful offenders. Forth (2005) has described the role of the PCL:YV in risk management as follows: "This information may be useful in identifying youth who represent a more serious management problem within institutions, who need intensive intervention, and who require more resources for risk management in the community" (p. 332). However, Forth cautioned that the PCL:YV is not appropriate as a basis for decisions regarding transfer to adult court or restricting treatment access. Furthermore, the manual for the PCL:YV explicitly states, "It is inappropriate for clinicians or other professionals to label a youth as a psychopath" (Forth et al., 2003, p. 17). A challenge in deciding what interventions are appropriate is that few studies have focused on the efficacy of interventions for adolescents with psychopathic features, particularly incarcerated ones, and none of them have examined long-term effects (Vincent, Kimonis, & Clark, 2016). However, some intervention studies with adolescents scoring high on the PCL:YV (Caldwell et al., 2006) and children with CU traits (Hawes & Dadds, 2005) have vielded promising results. Another challenge is the general mutability of traits and disorder symptoms in young people. Frick, Kimonis, Dandreaux, and Farell (2003), for example, found that CU traits were relatively stable for school-age children; however, only 30% of the children rated high in CU traits on the first assessment stayed high across the average 4-year study. Scores may be stable for an even smaller proportion of youth (14%) into young adulthood (Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007). This propensity for change in psychopathic tendencies across time can further complicate decisions regarding treatment and behavioral management more broadly.

We noted earlier in regard to adult populations that psychopathy as indexed by the PCL-R represents only one risk factor, not a comprehensive assessment of risk. This point is perhaps even more important with respect to youth. In predicting violent behavior in younger samples, it is important for measures of psychopathy to be used in conjunction with other environmental, individual, and familial risk indicators, and with attention to known protective factors (Herrenkohl, Hawkins, Chung, Hill, & Battin-Pearson, 2001; U.S. Department of Health and Human Services, 2001). Given that adolescence is a time of extreme developmental change, clinicians should routinely reassess psychopathic characteristics and affiliated risk in samples of problem youth to systematically evaluate whether maturation attenuates risk (Vincent et al., 2016).

### **Conclusions and Recommendations**

With some disclaimers, it is fair to state that psychopathy is an important and meaningful risk factor for subsequent antisocial behavior of many types, across many contexts, in many different types of people. We offer the following conclusions and caveats, which also serve to highlight directions for future research:

• Psychopathy, as a whole, has a moderate-size predictive effect with respect to future general and violent behavior, whether within institutions or in the community.

• The PCL family of measures has the greatest support with respect to predicting recidivism, with self-report measures showing effect sizes of comparable magnitude in a smaller number of studies (few of which have been prospective in nature).

• Psychopathy, as measured by the PCL family of instruments, is less strongly related to future sexual offending compared to violent and nonviolent offending, but this comparatively small association tends to be exacerbated when accompanied by sexual deviance.

• The behavioral features of psychopathy, regardless of measure, are more strongly and consistently associated with future violence and general recidivism than its interpersonal and affective features.

• The interpersonal and affective features of psychopathy may, however, influence the expression of and motivations for violence.

• The strength of association between psychopathy and future general and violent offending appears comparable for males and females, if not slightly stronger for females, but available findings to date leave open the possibility that gender may influence the nature of violence acts committed by psychopathic individuals, or other behavioral expressions of psychopathy (cf. Verona & Vitale, Chapter 21, this volume).

• The strength of association between psychopathy and future crime and violence is weaker in U.S. samples relative to Canadian or European samples. • Evidence is mixed regarding whether the magnitude of association between psychopathy and crime or violence is moderated by race or ethnicity.

• Reliability of PCL measures may be weaker in applied legal settings compared to research settings or nonadversarial applied settings, and this may affect the validity of scores for these measures, although effects on validity are not well established at this time.

• Youth psychopathy measures show associations with recidivism in young offender samples comparable to those for adult measures in older samples.

• There is not yet a solid body of research on moderating effects of gender, race or ethnicity, and youth on relations between psychopathy and recidivism.

• Evidence for the incremental validity of psychopathy measures above and beyond other risk factors for crime and violence is mixed and not well established.

• Although novel models and measures of psychopathy—such as the CAPP and the TriPM have shown promise as subjects of ever-increasing research, they do not yet have a well-established body of support as predictors of recidivism.

• Although psychopathy is associated with violence, and forms an important part of existing risk assessment protocols, many contemporary instruments for violence risk assessment tend to outperform measures of psychopathy when pitted directly against them.

• Countering discouraging results from early research, newer studies have shown promise for risk management and treatment programs in reducing future crime and violence among highly psychopathic patients and offenders.

Psychopathy has been described as a "socially devastating disorder" (Hare, 1998b, p. 188) or a "condition of interpersonal impact" (Lilienfeld, 2013, p. 86), and there can be little doubt about the harm it causes to individuals in society—regardless of how exactly it is conceptualized or measured. Despite this, we caution (as we did in the original version of this chapter) against considering psychopathy a harbinger of ineluctable danger—automatically elevating risk for all types of criminal and violent behavior—or its absence an indication of the absence of risk. Having revisited the topic of psychopathy and recidivism in the light of a decade of new research findings, we find ourselves both encouraged by the advances in knowledge during this relatively short time, and energized by the challenges and possibilities that lie ahead.

### NOTE

1. We are aware of the controversy surrounding the "youth psychopathy" issue (see, e.g., in this volume, Chapter 19 by Frick & Marsee; Chapter 20 by Salekin, Andershed, & Clark; and Chapter 30 by Edens, Petrila, & Kelley), and we do not assume here that psychopathy exists as a stable personality orientation or condition in the preadult years. We are referring merely to scores on measures of psychopathic features in younger participant samples.

### REFERENCES

- Andershed, H. A., Gustafson, S. B., Kerr, M., & Stattin, H. (2002). The usefulness of self-reported psychopathy-like traits in the study of antisocial behaviour among non-referred adolescents. *European Journal of Personality*, 16, 383–402.
- Andrews, D. A. (2012). The risk-need-responsivity (RNR) model of correctional assessment and treatment. In J. A. Dvoskin, J. L. Skeem, R. W. Novaco, & K. S. Douglas (Eds.), Using social science to reduce violent offending (pp. 127–156). New York: Oxford University Press.
- Andrews, D. A., & Bonta, J. (1995). The Level of Service Inventory—Revised (LSI-R). Toronto: Multi-Health Systems.
- Asscher, J. J., van Vugt, E. S., Stams, G., Dekovic, M., Eichelsheim, V. I., & Yousfi, S. (2011). The relationship between juvenile psychopathic traits, delinquency and (violent) recidivism: A meta-analysis. *Journal* of Child Psychology and Psychiatry, 52, 1134–1143.
- Barbaree, H. E., Seto, M. C., Langton, C. M., & Peacock, E. J. (2001). Evaluating the predictive accuracy of six risk assessment instruments for adult sex offenders. *Criminal Justice and Behavior*, 28(4), 490–521.
- Beggs, S. M., & Grace, R. C. (2008). Psychopathy, intelligence, and recidivism in child molesters: Evidence of an interaction effect. *Criminal Justice and Behavior*, 35(6), 683–695.
- Berry, J. W., Poortinga, Y. H., Segall, M. H., & Dasen, P. R. (1992). Cross-cultural psychology: Research and applications. Cambridge, UK: Cambridge University Press.
- Blais, J., Solodukhin, E., & Forth, A. E. (2014). A meta-analysis exploring the relationship between psychopathy and instrumental versus reactive violence. *Criminal Justice and Behavior*, 41(7), 797–821.
- Boccaccini, M. T., Epstein, M., Poythress, N., Douglas, K. S., Campbell, J., Gardner, G., et al. (2007). Selfreport measures of child and adolescent psychopathy

as predictors of offending in four samples of justiceinvolved youth. Assessment, 14, 361–374.

- Boccaccini, M. T., Turner, D. T., & Murrie, D. C. (2008). Do some evaluators report consistently higher or lower scores on the PCL-R?: Findings from a statewide sample of sexually violent predator evaluations. Psychology, Public Policy, and Law, 14, 262–283.
- Boccaccini, M. T., Turner, D., Murrie, D. C., & Rufino, K. A. (2012). Do PCL-R scores from state or defense experts best predict future misconduct among civilly committed sex offenders? *Law and Human Behavior*, 36(3), 159–169.
- Boer, D. P., Hart, S. D., Kropp, P. R., & Webster, C. D. (1997). Manual for the Sexual Violence Risk—20: Professional guidelines for assessing risk of sexual violence. Vancouver: British Columbia Institute on Family Violence and Mental Health, Law, and Policy Institute, Simon Fraser University.
- Bonta, J., Law, M., & Hanson, K. (1998). The prediction of criminal and violent recidivism among mentally disordered offenders: A meta-analysis. *Psychological Bulletin*, 123, 123–142.
- Borum, R., Bartel, P., & Forth, A. (2006). Manual for the Structured Assessment of Violence Risk in Youth (SAVRY). Odessa, FL: Psychological Assessment Resources.
- Brandt, J. R., Wallace, A. K., Patrick, C. J., & Curtin, J. J. (1997). Assessment of psychopathy in a population of incarcerated adolescent offenders. *Psychological Assessment*, 9, 429–435.
- Brinkley, C. A., Schmitt, W. A., Smith, S. S., & Newman, J. P. (2001). Construct validation of a self-report psychopathy scale: Does Levenson's Self-Report Psychopathy scale measure the same constructs as Hare's Psychopathy Checklist—Revised? *Personality and Individual Differences*, 31(7), 1021–1038.
- Caldwell, M., Skeem, J., Salekin, R., & van Rybroek, G. (2006). Treatment response of adolescent offenders with psychopathy features: A 2-year follow-up. Criminal Justice and Behavior, 33, 571–596.
- Cale, E. M., & Lilienfeld, S. O. (2002). Sex differences in psychopathy and antisocial personality disorder: A review and integration. *Clinical Psychology Review*, 22, 1179–1207.
- Camp, J. P., Skeem, J. L., Barchard, K., Lilienfeld, S. O., & Poythress, N. G. (2013). Psychopathic predators?: Getting specific about the relation between psychopathy and violence. *Journal of Consulting and Clinical Psychology*, 81(3), 467–480.
- Campbell, M. A., French, S., & Gendreau, P. (2009). The prediction of violence in adult offenders: A meta-analytic comparison of instruments and methods of assessment. *Criminal Justice and Behavior*, 36(6), 567–590.
- Cauffman, E., Kimonis, E. R., Dmitrieva, J., & Monahan, K. C. (2009). A multimethod assessment of juvenile psychopathy: Comparing predictive utility of the PCL:YV, YPI, and NEO-PRI. *Psychological Assessment*, 21, 528–542.

- Chakhssi, F., de Ruiter, C., & Bernstein, D. (2010). Change during forensic treatment in psychopathic versus nonpsychopathic offenders. *Journal of Forensic Psychiatry and Psychology*, 21(5), 660–682.
- Cleckley, H. (1976). *The mask of sanity* (5th ed.). St. Louis, MO: Mosby. (Original work published 1941)
- Coid, J., & Yang, M. (2011). The impact of psychopathy on violence among the household population of Great Britain. Social Psychiatry and Psychiatric Epidemiology, 46(6), 473–480.
- Coid, J., Yang, M., Ullrich, S., Roberts, A., & Hare, R. D. (2009). Prevalence and correlates of psychopathic traits in the household population of Great Britain. *International Journal of Law and Psychiatry*, 32, 65–73.
- Coid, J., Yang, M., Ullrich, S., Zhang, T., Sizmur, S., Roberts, C., et al. (2009). Gender differences in structured risk assessment: Comparing the accuracy of five instruments. *Journal of Consulting and Clinical Psychology*, 77(2), 337–348.
- Colins, O. F., Vermeiren, R., De Bolle, M., & Broekaert, E. (2012). Self-reported psychopathic-like traits as predictors of recidivism in detained male adolescents. Criminal Justice and Behavior, 39, 1421–1435.
- Cooke, D. J., Hart, S. D., Logan, C., & Michie, C. (2012). Explicating the construct of psychopathy: Development and validation of a conceptual model, the comprehensive assessment of psychopathic personality (CAPP). International Journal of Forensic Mental Health, 11(4), 242–252.
- Cooke, D. J., Kosson, D. S., & Michie, C. (2001). Psychopathy and ethnicity: Structural, item, and test generalizability of the Psychopathy Checklist—Revised (PCL-R) in Caucasian and African American participants. Psychological Assessment, 13(4), 531–542.
- Cooke, D. J., & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment*, 13(2), 171–188.
- Cooke, D. J., Michie, C., Hart, S. D., & Clark, D. A. (2004). Reconstructing psychopathy: Clarifying the significance of antisocial and socially deviant behavior in the diagnosis of psychopathic personality disorder. *Journal of Personality Disorders*, 18, 337–357.
- Cooke, D. J., Michie, C., Hart, S. D., & Clark, D. (2005). Searching for the pan-cultural core of psychopathic personality disorder. *Personality and Individual Differences*, 39(2), 283–295.
- Copas, J., & Marshall, P. (1998). The Offender Group Reconviction Scale: A statistical reconviction score for use by probation officers. *Journal of the Royal Statistical Society C: Applied Statistics*, 47(1), 159–171.
- Cornell, D. G., Warren, J., Hawk, G., Stafford, E., Oram, G., & Pine, D. (1996). Psychopathy in instrumental and reactive violent offenders. *Journal of Consulting* and Clinical Psychology, 64(4), 783–790.
- Corrado, R. R., Vincent, G. M., Hart, S. D., & Cohen, I. M. (2004). Predictive validity of the Psychopathy Checklist: Youth Version for general and violent recidivism. Behavioral Sciences and the Law, 22, 5–22.

- Crick, N. R., & Grotpeter, J. K. (1995). Relational aggression, gender, and social-psychological adjustment. Child Development, 66, 710–722.
- DeMatteo, D., Edens, J. F., Galloway, M., Cox, J., Smith, S. T., & Formon, D. (2014). The role and reliability of the Psychopathy Checklist—Revised in U.S. sexually violent predator evaluations: A case law survey. *Law and Human Behavior*, 38(3), 248–255.
- Douglas, K. S., Cox, D. N., & Webster, C. D. (1999). Violence risk assessment: Science and practice. Legal and Criminological Psychology, 4, 149–184.
- Douglas, K. S., Epstein, M. E., & Poythress, N. G. (2008). Criminal recidivism among juvenile offenders: Evaluating the incremental and predictive validity of three measures of psychopathic features. *Law* and Human Behavior, 32, 423–438.
- Douglas, K. S., Hart, S. D., Webster, C. D., & Belfrage, H. (2013). HCR-20 (Version 3): Assessing Risk for Violence, User Guide. Burnaby, BC, Canada: Mental Health, Law, and Policy Institute, Simon Fraser University.
- Douglas, K. S., Nikolova, N. L., Kelley, S., & Edens, J. F. (2015). Psychopathy. In B. Cutler & P. Zapf (Eds.), APA handbook of forensic psychology (Vol. 1, pp. 257– 323). Washington, DC: American Psychological Association.
- Douglas, K. S., & Skeem, J. L. (2005). Violence risk assessment: Getting specific about being dynamic. Psychology, Public Policy, and Law, 11(3), 347–383.
- Douglas, K. S., Skeem, J. L., & Nicholson, E. (2011). Research methods in violence risk assessment. In B. Rosenfeld & S. Penrod (Eds.), *Research methods in forensic psychology* (pp. 325–346). New York: Wiley.
- Douglas, K. S., Strand, S., Belfrage, H., Fransson, G., & Levander, S. (2005). Reliability and validity evaluation of the Psychopathy Checklist: Screening Version (PCL:SV) in Swedish correctional and forensic psychiatric samples. Assessment, 12, 145–161.
- Douglas, K. S., Vincent, G. M., & Edens, J. F. (2006). Risk for criminal recidivism: The role of psychopathy. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 533–554). New York: Guilford Press.
- Drislane, L. E., Patrick, C. J., Sourander, A., Sillanmäki, L., Aggen, S. H., Elonheimo, H., et al. (2014). Distinct variants of extreme psychopathic individuals in society at large: Evidence from a population-based sample. Personality Disorders: Theory, Research, and Treatment, 5(2), 154–163.
- Dyck, H. L., Campbell, M., Schmidt, F., & Wershler, J. L. (2013). Youth psychopathic traits and their impact on long-term criminal offending trajectories. Youth Violence and Juvenile Justice, 11, 230–248.
- Edens, J. F., Buffington-Vollum, J. K., Keilen, A., Roskamp, P., & Anthony, C. (2005). Predictions of future dangerousness in capital murder trials: Is it time to "disinvent the wheel"? *Law and Human Behavior*, 29, 55–86.
- Edens, J. F., & Cahill, M. A. (2007). Psychopathy in adolescence and criminal recidivism in young adult-

hood: Longitudinal results from a multiethnic sample of youthful offenders. Assessment, 14(1), 57–64.

- Edens, J. F., Campbell, J. S., & Weir, J. M. (2007). Youth psychopathy and criminal recidivism: A meta-analysis of the Psychopathy Checklist measures. *Law and Human Behavior*, 31(1), 53–75.
- Edens, J. F., Cox, J., Smith, S. T., DeMatteo, D., & Sörman, K. (2015). How reliable are Psychopathy Checklist—Revised scores in Canadian criminal trials?: A case law review. *Psychological Assessment*, 27(2), 447–456.
- Edens, J. F., Hart, S. D., Johnson, D. W., Johnson, J., & Olver, M. E. (2000). Use of the Personality Assessment Inventory to assess psychopathy in offender populations. *Psychological Assessment*, 12, 132–139.
- Edens, J. F., Petrila, J., & Buffington-Vollum, J. K. (2001). Psychopathy and the death penalty: Can the Psychopathy Checklist—Revised identify offenders who represent "an ongoing threat to society"? Journal of Psychiatry and the Law, 29, 433–481.
- Falkenbach, D. M., Poythress, N. G., & Heide, K. M. (2003). Psychopathic features in juvenile diversion program: Reliability and predictive validity of two elf-report measures. *Behavioral Sciences and the Law*, 21, 787–805.
- Fazel, S., Singh J. P., Doll, H., & Grann, M. (2012). Use of risk assessment instruments to predict violence and antisocial behaviour in 73 samples involving 24,827 people: Systematic review and meta-analysis. *British Medical Journal*, 345, Article No. e4692.
- Firestone, P., Bradford, J. M., Greenberg, D. M., & Serran, G. A. (2000). The relationship of deviant sexual arousal and psychopathy in incest offenders, extrafamilial child molesters, and rapists. *Journal of the American Academy of Psychiatry and the Law*, 28(3), 303–308.
- Forth, A. E. (2005). The Hare Psychopathy Checklist: Youth Version. In T. Grisso, G. M. Vincent, & D. Seagrave (Eds.), *The handbook of screening and assessment tools for juvenile justice* (pp. 324–338). New York: Guilford Press.
- Forth, A. E., Kosson, D. S., & Hare, R. D. (2003). Hare Psychopathy Checklist: Youth Version. Toronto: Multi-Health Systems.
- Fowles, D. (1980). The three arousal model: Implications for Gray's two-factor learning theory for heart rate, electrodermal activity, and psychopathy. *Psychophysiology*, 17, 87–104.
- Frick, P. J., & Hare, R. D. (2001). The Antisocial Process Screening Device. Toronto: Multi-Health Systems.
- Frick, P. J., Kimonis, E. R., Dandreax, D. M., & Farell, J. M. (2003). The 4-year stability of psychopathic traits in non-referred youth. *Behavioral Sciences and the Law*, 21, 713–736.
- Gardner, B. O., Boccaccini, M. T., Bitting, B. S., & Edens, J. F. (2014). Personality Assessment Inventory scores as predictors of misconduct, recidivism, and violence: A meta-analytic review. *Psychological Assessment*, 27(2), 534–544.

- Gendreau, P., Goggin, C., & Smith, P. (2002). Is the PCL-R really the "unparalleled" measure of offender risk?: A lesson in knowledge cumulation. Criminal Justice and Behavior, 29, 397–426.
- Gendreau, P., Goggin, C., & Smith, P. (2003). Erratum. Criminal Justice and Behavior, 30, 722–724.
- Gendreau, P., Little, T., & Goggin, C. (1996). A metaanalysis of the predictors of adult offender recidivism: What works! Criminology, 34, 575–607.
- Grann, M., & Wedin, I. (2001). Risk factors for recidivism among spousal assault and spousal homicide offenders. *Psychology*, *Crime*, and Law, 8, 1–19.
- Gray, J. (1987). The psychology and fear and stress (2nd ed.). Cambridge, UK: Cambridge University Press.
- Gray, N. S., Fitzgerald, S., Taylor, J., MacCulloch, M. J., & Snowden, R. J. (2007). Predicting future reconviction in offenders with intellectual disabilities: The predictive efficacy of VRAG, PCL-SV, and the HCR-20. Psychological Assessment, 19(4), 474–479.
- Gretton, H. M., McBride, M., Hare, R. D., O'Shaughnessy, R., & Kumka, G. (2001). Psychopathy and recidivism in adolescent sex offenders. Criminal Justice and Behavior, 28, 427–449.
- Guy, L. S., Douglas, K. S., & Hart, S. D. (2015). Risk assessment and communication. In B. Cutler & P. Zapf (Eds.), APA handbook of forensic psychology (Vol. 1, pp. 35–86). Washington, DC: American Psychological Association.
- Guy, L. S., Douglas, K. S., & Hendry, M. (2010). The role of psychopathic personality disorder in violence risk assessments using the HCR-20. *Journal of Personality Disorders*, 24, 551–580.
- Guy, L. S., Edens, J. F., Anthony, C., & Douglas, K. S. (2005). Does psychopathy predict institutional misconduct among adults?: A meta-analytic investigation. Journal of Consulting and Clinical Psychology, 73, 1056–1064.
- Guy, L. S., Packer, I. K., & Warnken, W. (2012). Assessing risk of violence using structured professional judgment guidelines. *Journal of Forensic Psychology Practice*, 12, 270–283.
- Hanson, R. K., & Harris, A. J. R. (2000). Where should we intervene?: Dynamic predictors of sexual offense recidivism. Criminal Justice and Behavior, 27(1), 6–35.
- Hanson, R. K., & Morton-Bourgon, K. (2005). The characteristics of persistent sexual offenders: A meta-analysis of recidivism studies. *Journal of Consulting* and Clinical Psychology, 73, 1154–1163.
- Hare, R. D. (1991). The Hare Psychopathy Checklist—Revised. Toronto: Multi-Health Systems.
- Hare, R. D. (1998b). Psychopaths and their nature: Implications for the mental health and criminal justice systems. In T. Millon, E. Simonson, M. Burket-Smith, & R. Davis (Eds.), Psychopathy: Antisocial, criminal, and violent behavior (pp. 188–212). New York: Guilford Press.
- Hare, R. D. (2003). *The Hare PCL-R* (2nd ed.). Toronto: MultiHealth Systems.
- Hare, R. D., & Neumann, C. S. (2010). The role of antisociality in the psychopathy construct: Comment on

Skeem and Cooke (2010). Psychological Assessment, 22(2), 446–454.

- Harris, G. T., Rice, M. E., & Quinsey, V. L. (1993). Violent recidivism of mentally disordered offenders: The development of a statistical prediction instrument. *Criminal Justice and Behavior*, 20, 315–335.
- Hart, S. D. (1998). The role of psychopathy in assessing risk for violence: Conceptual and methodological issues. *Legal and Criminological Psychology*, 3(1), 121–137.
- Hart, S. D., Cox, D. N., & Hare, R. D. (1995). Manual for the Psychopathy Checklist: Screening Version (PCL:SV). Toronto: Multi-Health Systems.
- Hart, S. D., Kropp, P. R., Laws, D. R., Klaver, J., Logan, C., & Watt, K. A. (2003). The risk for sexual violence protocol. Burnaby, BC, Canada: Simon Fraser University.
- Hawes, D. J., & Dadds, M. R. (2005). The treatment of conduct problems in children with callous–unemotional traits. Journal of Consulting and Clinical Psychology, 73, 737–741.
- Hawes, S. W., Boccaccini, M. T., & Murrie, D. C. (2013). Psychopathy and the combination of psychopathy and sexual deviance as predictors of sexual recidivism: Meta-analytic findings using the Psychopathy Checklist—Revised. *Psychological Assessment*, 25(1), 233–243.
- Heilbrun, K., Hart, S. D., Hare, R. D., Gustafson, D., Nunez, C., & White, A. (1998). Inpatient and postdischarge aggression in mentally disordered offenders: The role of psychopathy. *Journal of Interpersonal Violence*, 13, 514–527.
- Hemphälä, M., & Hodgins, S. (2014). Do psychopathic traits assessed in mid-adolescence predict mental health, psychosocial, and antisocial, including criminal outcomes, over the subsequent 5 years? *Canadian Journal of Psychiatry*, 59(1), 40–49.
- Hemphill, J. F., & Hare, R. D. (2004). Some misconceptions about the Hare PCL-R and risk assessment: A reply to Gendreau, Goggin, and Smith. Criminal Justice and Behavior, 31, 203–243.
- Hemphill, J. F., Hare, R. D., & Wong, S. (1998). Psychopathy and recidivism: A review. Legal and Criminological Psychology, 3, 141–172.
- Hemphill, J. F., & Hart, S. D. (2003). Forensic and clinical issues in the assessment of psychopathy. In I. B. Weiner (Series Ed.) & A. M. Goldstein (Vol. Ed.), Comprehensive handbook of psychology: Vol. 2. Forensic psychology (pp. 87–107). New York: Wiley.
- Hemphill, J. F., Templeman, R., Wong, S., & Hare, R. D. (1998). Psychopathy and crime: Recidivism and behavior. In D. J. Cooke, A. E. Forth, & R. D. Hare (Eds.), Psychopathy: Theory, research, and implications for society (pp. 375–399), Dordrecht, The Netherlands: Kluwer Academic.
- Herrenkohl, T. I., Hawkins, J. D., Chung, I. J., Hill, K. G., & Battin-Pearson, S. (2001). School and community risk factors and interventions. In R. Loeber & D. P. Farringon (Eds.), Child delinquents: Development, intervention, and service needs (pp. 211–246). Thousand Oaks, CA: SAGE.

- Hervé, H., Vincent, G. M., Kropp, P. R., & Hare, R. D. (2001, April). Psychopathy and spousal assault. Paper presented at the founding conference of the International Association of Mental Health Services, Vancouver, BC, Canada.
- Hicks, B. M., Markon, K. E., Patrick, C. J., Krueger, R. F., & Newman, J. P. (2004). Identifying psychopathy subtypes on the basis of personality structure. *Psychological Assessment*, 16(3), 276–288.
- Hicks, M. M., Rogers, R., & Cashel, M. (2000). Predictions of violent and total infractions among institutionalized male juvenile offenders. *Journal of the American Academy of Psychiatry and the Law*, 28(2), 183–190.
- Hildebrand, M., & de Ruiter, C. (2012). Psychopathic traits and change on indicators of dynamic risk factors during inpatient forensic psychiatric treatment. *International Journal of Law and Psychiatry*, 35(4), 276–288.
- Hildebrand, M., de Ruiter, C., & de Vogel, V. (2004). Psychopathy and sexual deviance in treated rapists: Association with sexual and non-sexual recidivism. Sexual Abuse: A Journal of Research and Treatment, 16(1), 1–4.
- Hilton, N. Z., Harris, G. T., & Rice, M. E., Houghton, R. E., & Eke, A. W. (2008). An in-depth actuarial assessment for wife assault recidivism: The Domestic Violence Risk Appraisal Guide. *Law and Human Behavior*, 32, 150–163.
- Hoge, R. D., & Andrews, D. A. (2003). Youth Level of Service/Case Management Inventory users' manual. North Tonawanda, NY: Multi-Health Systems.
- Holtzworth-Munroe, A., & Stuart, G. L. (1994). Typologies of male batterers: Three subtypes and the differences among them. *Psychological Bulletin*, 116, 476–497.
- Huizinga, D., Loeber, R., & Thornberry, T. P. (1993). Urban delinquency and substance abuse: Technical report. Washington, DC: U.S. Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention.
- Hunter, J. A., Figueredo, A. J., Malamuth, N. M., & Becker, J. V. (2003). Juvenile sex offenders: Toward the development of a typology. Sex Abuse: Journal of Research and Treatment, 15, 27–47.
- Huss, M. T., & Langhinrichsen-Rohling, J. (2006). Assessing the generalization of psychopathy in a clinical sample of domestic violence perpetrators. *Law and Human Behavior*, 30, 571–586.
- Jackson, R. L., Neumann, C. S., & Vitacco, M. J. (2007). Impulsivity, anger, and psychopathy: The moderating effect of ethnicity. *Journal of Personality Disorders*, 21, 289–304.
- Jackson, R. L., Rogers, R., Neumann, C. S., & Lambert, P. L. (2002). Psychopathy in female offenders: An investigation of its underlying dimensions. *Criminal Justice and Behavior*, 29, 692–704.
- Judd, C. M., Kenny, D. A., & McClelland, G. H. (2001). Estimating and testing mediation and moderation in within-participant designs. *Psychological Methods*, 6, 115–134.

- Kahn, R. E., Frick, P. J., Youngstrom, E., Findling, R. L., & Youngstrom, J. K. (2012). The effects of including a callous–unemotional specifier for the diagnosis of conduct disorder. *Journal of Child Psychology and Psychiatry*, 53(3), 271–282.
- Karpman, B. (1941). On the need of separating psychopathy into two distinct clinical types: The symptomatic and the idiopathic. *Journal of Criminal Psychopa*thology, 3, 112–137.
- Kennealy, P. J., Skeem, J. L., Walters, G. D., & Camp, J. (2010). Do core interpersonal and affective traits of PCL-R psychopathy interact with antisocial behavior and disinhibition to predict violence? *Psychological Assessment*, 22(3), 569–580.
- Kimonis, E. R., Skeem, J. L., Cauffman, E., & Dmitrieva, J. (2011). Are secondary variants of juvenile psychopathy more reactively violent and less psychosocially mature than primary variants? *Law and Human Behavior*, 35(5), 381–391.
- Kingston, D. A., Firestone, P., Wexler, A., & Bradford, J. M. (2008). Factors associated with recidivism among intrafamilial child molesters. *Journal of Sexual Ag*gression, 14(1), 3–18.
- Kosson, D. S., Cyterski, T. D., Steuerwald, B. L., Neumann, C. S., & Walker-Matthews, S. (2002). The reliability and validity of the Psychopathy Checklist: Youth Version (PCL:YV) in nonincarcerated adolescent males. *Psychological Assessment*, 14, 97–109.
- Kosson, D. S., Neumann, C. S., Forth, A. E., Salekin, R. T., Hare, R. D., Krischer, M. K., et al. (2013). Factor structure of the Hare Psychopathy Checklist: Youth Version (PCL:YV) in adolescent females. *Psychological Assessment*, 25, 71–83.
- Kosson, D. S., Smith, S. S., & Newman, J. P. (1990). Evaluating the construct validity of psychopathy in Black and White male inmates: Three preliminary studies. *Journal of Abnormal Psychology*, 99(3), 250– 259.
- Kreis, M. F., & Cooke, D. J. (2011). Capturing the psychopathic female: A prototypicality analysis of the Comprehensive Assessment of Psychopathic Personality (CAPP) across gender. Behavioral Sciences and the Law, 29(5), 634–648.
- Kropp, P. R., Hart, S. D., Webster, C. D., & Eaves, D. (1999). Spousal Assault Risk Assessment guide user's manual. Toronto: Multi-Health Systems/British Columbia Institute on Family Violence.
- Lahey, B. B., Loeber, R., Quay, H., Applegate, B., Shaffer, D., Waldman, I., Hart, E. L., et al. (1998). Validity of DSM-IV subtypes of conduct disorder based on age of onset. Journal of the American Academy of Child and Adolescent Psychiatry, 37, 435–442.
- Långström, N., & Grann, M. (2000). Risk for criminal recidivism among young sex offenders. *Journal of In*terpersonal Violence, 15, 856–872.
- Leistico, A.-M. R., Salekin, R. T., DeCoster, J., & Rogers, R. (2008). A large-scale meta-analysis relating the Hare measures of psychopathy to antisocial conduct. Law and Human Behavior, 32, 28–45.
- Lilienfeld, S. O. (1994). Conceptual problems in the as-

sessment of psychopathy. Clinical Psychology Review, 14, 17–38.

- Lilienfeld, S. O. (2013). Is psychopathy a syndrome?: Comment on Marcus, Fulton and Edens (2011). Personality Disorders: Theory, Research, and Treatment, 4, 85–86.
- Looman, J., Morphett, N. C., & Abracen, J. (2013). Does consideration of psychopathy and sexual deviance add to the predictive validity of the Static-99R? International Journal of Offender Therapy and Comparative Criminology, 57(8), 939–965.
- Loucks, A. D., & Zamble, E. (2000). Predictors of criminal behavior and prison misconduct in serious female offenders. *Empirical and Applied Criminal Justice Review*, 1(1), 1–47.
- Lynam, D. R., Caspi, A., Moffitt, T. E., Loeber, R., & Stouthamer-Loeber, M. (2007). Longitudinal evidence that psychopathy scores in early adolescence predict adult psychopathy. *Journal of Abnormal Psychology*, 116, 155–165.
- Lynam, D. R., Miller, D. J., Vachon, D., Loeber, R., & Stouthamer-Loeber, M. (2009). Psychopathy in adolescence predicts official reports of offending in adulthood. Youth Violence and Juvenile Justice, 7(3), 189–207.
- Lyon, D. R., Hart, S. D., & Webster, C. D. (2001). Violence risk assessment. In R. Schuller & J. R. P. Ogloff (Eds.), Law and psychology: Canadian perspectives (pp. 314–350). Toronto: University of Toronto Press.
- Mager, K. L., Bresin, K., & Verona, E. (2014). Gender, psychopathy factors, and intimate partner violence. Personality Disorder: Theory, Research, and Treatment, 5, 257–267.
- Marcus, D. K., Fulton, J. J., & Edens, J. F. (2013). The two-factor model of psychopathic personality: Evidence from the Psychopathic Personality Inventory. *Personality Disorders: Theory, Research, and Treatment*, 4, 67–76.
- McDermott, B. E., Edens, J. F., Quanbeck, C. D., Busse, D., & Scott, C. L. (2008). Examining the role of static and dynamic risk factors in the prediction of inpatient violence: Variable- and person-focused analyses. Law and Human Behavior, 32(4), 325–338.
- McMahon, R. J., Witkiewitz, K., Kotler, J. S., & Conduct Problems Prevention Research Group. (2010). Predictive validity of callous–unemotional traits measured in early adolescence with respect to multiple antisocial outcomes. *Journal of Abnormal Psychology*, 199, 752–763.
- Mealey, L. (1995). The sociobiology of sociopathy: An integrated evolutionary model. *Behavioral and Brain Sciences*, 18, 523–599.
- Miller, C. S., Kimonis, E. R., Otto, R. K., Kline, S. M., & Wasserman, A. L. (2012). Reliability of risk assessment measures used in Sexually Violent Predator proceedings. *Psychological Assessment*, 24(4), 944–953.
- Miller, J. D., & Lynam, D. R. (2012). An examination of the Psychopathic Personality Inventory's nomological network: A meta-analytic review. *Personal*-

ity Disorders: Theory, Research, and Treatment, 3(3), 305–326.

- Mokros, A., Neumann, C. S., Stadtland, C., Osterheider, M., Nedopil, N., & Hare, R. D. (2011). Assessing measurement invariance of PCL-R assessments from file reviews of North American and German offenders. International Journal of Law and Psychiatry, 34, 56–63.
- Monahan, J., Steadman, H. J., Appelbaum, P. S., Robbins, P. C., Mulvey, E. P., Silver, E., et al. (2000). Developing a clinically useful actuarial tool for assessing violence risk. *British Journal of Psychiatry*, 176(4), 312–319.
- Monahan, J., Steadman, H. J., Silver, E., Appelbaum, P. S., Robbins, P. C., Mulvey, E. P., et al. (2001). Rethinking risk assessment: The MacArthur study of mental disorder and violence. New York: Oxford University Press.
- Morey, L. C. (2007). Personality Assessment Inventory: Professional manual (2nd ed.). Odessa, FL: Psychological Assessment Resources.
- Morrissey, C., Hogue, T., Mooney, P., Allen, C., Johnston, S., Hollin, C., et al. (2007). Predictive validity of the PCL-R in offenders with intellectual disability in a high secure hospital setting: Institutional aggression. *Journal of Forensic Psychiatry and Psychology*, 18(1), 1–15.
- Morrissey, C., Mooney, P., Hogue, T. E., Lindsay, W. R., & Taylor, J. L. (2007). Predictive validity of the PCL-R for offenders with intellectual disability in a high security hospital: Treatment progress. *Journal* of Intellectual and Developmental Disability, 32(2), 125–133.
- Muñoz, L. C., & Frick, P. J. (2007). The reliability, stability, and predictive utility of the self-report version of the Antisocial Process Screening Device. Scandinavian Journal of Psychology, 48(4), 299–312.
- Murrie, D. C., Boccaccini, M. T., Caperton, J., & Rufino, K. (2012). Field validity of the Psychopathy Checklist—Revised in sex offender risk assessment. *Psychological Assessment*, 24(2), 524–529.
- Murrie, D. C., Boccaccini, M. T., Guarnera, L. A., & Rufino, K. (2013). Are forensic experts biased by the side that retained them? *Psychological Science*, 24(10), 1889–1897.
- Murrie, D. C., Boccaccini, M., Johnson, J., & Janke, C. (2008). Does interrater (dis)agreement on Psychopathy Checklist scores in sexually violent predator trials suggest partisan allegiance in forensic evaluations? Law and Human Behavior, 32, 352–362.
- Murrie, D. C., Boccaccini, M., Turner, D., Meeks, M., Woods, C., & Tussey, C. (2009). Rater (dis)agreement on risk assessment measures in sexually violent predator proceedings: Evidence of adversarial allegiance in forensic evaluation? *Psychology, Public Policy, and Law, 15*, 19–53.
- Murrie, D. C., Cornell, D. G., Kaplan, S., McConville, D., & Levy-Elkon, A. (2004). Psychopathy scores and violence among juvenile offenders: A multi-measure study. Behavioral Sciences and the Law, 22, 49–67.

- Neves, A. C., Gonçalves, R. A., & Palma-Oliveira, J. M. (2011). Assessing risk for violent and general recidivism: A study of the HCR–20 and the PCL–R with a non-clinical sample of Portuguese offenders. *International Journal of Forensic Mental Health*, 10(2), 137–149.
- Nicholls, T. L., Ogloff, J. R. P., & Douglas, K. S. (2004). Research report: Assessing risk for violence among male and female civil psychiatric patients: The HCR-20, PCL:SV, and VSC. Behavioral Sciences and the Law, 22(1), 127–158.
- Ogloff, J. R., Wong, S., & Greenwood, A. (1990). Treating criminal psychopaths in a therapeutic community program. *Behavioral Sciences and the Law*, 8, 181–190.
- Olver, M. E., Lewis, K., & Wong, S. P. (2013). Risk reduction treatment of high-risk psychopathic offenders: The relationship of psychopathy and treatment change to violent recidivism. *Personality Disorders: Theory, Research, and Treatment*, 4(2), 160–167.
- Olver, M. E., Neumann, C. S., Wong, S. P., & Hare, R. D. (2013). The structural and predictive properties of the Psychopathy Checklist—Revised in Canadian Aboriginal and non-Aboriginal offenders. *Psychological Assessment*, 25(1), 167–179.
- Olver, M. E., Sewall, L. A., Sarty, G. E., Lewis, K., & Wong, S. P. (2015). A cluster analytic examination and external validation of psychopathic offender subtypes in a multisite sample of Canadian federal offenders. Journal of Abnormal Psychology, 124(2), 355–371.
- Olver, M. E., Stockdale, K. C., & Wormith, J. S. (2009). Risk assessment with young offenders: A meta-analysis of three assessment measures. *Criminal Justice and Behavior*, 36(4), 329–353.
- Olver, M. E., & Wong, S. P. (2009). Therapeutic responses of psychopathic sexual offenders: Treatment attrition, therapeutic change, and long-term recidivism. Journal of Consulting and Clinical Psychology, 77(2), 328–336.
- Patrick, C. J., & Drislane, L. E. (2015). Triarchic model of psychopathy: Origins, operationalizations, and observed linkages with personality and general psychopathology. *Journal of Personality*, 83, 627–643.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. Development and Psychopathology, 21, 913–938.
- Patrick, C. J., & Zempolich, K. A. (1998). Emotion and aggression in the psychopathic personality. Aggression and Violent Behavior, 3(4), 303–338.
- Pedersen, L., Kunz, C., Rasmussen, K., & Elsass, P. (2010). Psychopathy as a risk factor for violent recidivism: Investigating the Psychopathy Checklist Screening Version (PCL:SV) and the Comprehensive Assessment of Psychopathic Personality (CAPP) in a forensic psychiatric setting. International Journal of Forensic Mental Health, 9(4), 308–315.
- Pithers, W. D., Gray, A., Busconi, A., & Houchens, P. (1998). Five empirically-derived subtypes of children with sexual behaviour problems: Characteristics po-

tentially related to juvenile delinquency and adult criminality. Irish Journal of Psychology, 19, 49–67.

- Polaschek, D. L., & Ross, E. C. (2010). Do early therapeutic alliance, motivation, and stages of change predict therapy change for high-risk, psychopathic violent prisoners? Criminal Behaviour and Mental Health, 20(2), 100–111.
- Porter, S. (1996). Without conscience or without active conscience?: The etiology of psychopathy revisited. Aggression and Violent Behavior, 1(2), 179–189.
- Porter, S., Fairweather, D., Drugge, J., Hervé, H., Birt, A., & Boer, D. P. (2000). Profiles of psychopathy in incarcerated sexual offenders. *Criminal Justice and Behavior*, 27(2), 216–233.
- Poythress, N. G., Edens, J. F., Skeem, J. L., Lilienfeld, S. O., Douglas, K. S., Frick, P. J., et al. (2010). Identifying subtypes among offenders with antisocial personality disorder: A cluster-analytic study. *Journal of Abnormal Psychology*, 119, 389–400.
- Preacher, K. J., Zhang, Z., & Zyphur, M. J. (2016). Multilevel structural equation models for assessing moderation within and across levels of analysis. *Psychological Methods*, 21(2), 189–205.
- Quinsey, V. L., Harris, G. T., Rice, M. E., & Cormier, C. (1998). Violent offenders: Appraising and managing risk. Washington, DC: American Psychological Association.
- Quinsey, V. L., Harris, G. T., Rice, M. E., & Cormier, C. (2006). Violent offenders: Appraising and managing risk (2nd ed.). Washington, DC: American Psychological Association.
- Quinsey, V. L., Rice, M. E., & Harris, G. T. (1995). Actuarial prediction of sexual recidivism. *Journal of In*terpersonal Violence, 10(1), 85–105.
- Rettenberger, M., & Eher, R. (2013). Actuarial risk assessment in sexually motivated intimate-partner violence. Law and Human Behavior, 37(2), 75–86.
- Rice, M. E., & Harris, G. T. (1997). Cross-validation and extension of the Violence Risk Appraisal Guide for child molesters and rapists. *Law and Human Behavior*, 21(2), 231–241.
- Rice, M. E., Harris, G. T., & Cormier, C. A. (1992). An evaluation of a maximum security therapeutic community for psychopaths and other mentally disordered offenders. *Law and Human Behavior*, 16(4), 399–412.
- Richards, H. J., Casey, J. O., & Lucente, S. W. (2003). Psychopathy and treatment response in incarcerated female substance abusers. *Criminal Justice and Behavior*, 30(2), 251–276.
- Ridenour, T. A., Marchant, G. J., & Dean, R. S. (2001). Is the Revised Psychopathy Checklist clinically useful for adolescents? *Journal of Psychoeducational As*sessment, 19, 227–238.
- Robins, L. N., Tipp, J., & Przybeck, T. (1991). Psychiatric disorders in America. In L. N. Robins & D. A. Reiger (Eds.), Antisocial personality disorder (pp. 258– 290). New York: Free Press.
- Rock, R. C., Sellbom, M., Ben-Porath, Y. S., & Salekin, R. T. (2013). Concurrent and predictive validity of

psychopathy in a batterers intervention sample. *Law and Human Behavior*, *37*, 145–154.

- Salekin, R. T. (2008). Psychopathy and recidivism from mid-adolescence to young adulthood: Cumulating legal problems and limiting life opportunities. *Journal of Abnormal Psychology*, 117(2), 386–395.
- Salekin, R. T., Rogers, R., & Sewell, K. W. (1996). A review and meta-analysis of the Psychopathy Checklist and Psychopathy Checklist—Revised: Predictive validity of dangerousness. *Clinical Psychology: Science* and Practice, 3, 203–215.
- Salekin, R., Rogers, R., Ustad, K. L., & Sewell, K. (1998). Psychopathy and recidivism among female inmates. *Law and Human Behavior*, 22(1), 109–128.
- Schmidt, F. L. (2013). Meta-analysis. In J. A. Schinka, W. F. Velicer, & I. B. Weiner (Eds.), *Handbook of psychology: Vol. 2. Research methods in psychology* (2nd ed., pp. 571–594). Hoboken, NJ: Wiley.
- Schmidt, F., Campbell, M. A., & Houlding, C. (2011). Comparative analyses of the YLS/CMI, SAVRY, and PCL:YV in adolescent offenders: A 10-year follow-up into adulthood. Youth Violence and Juvenile Justice, 9(1), 23–42.
- Schmidt, F., McKinnon, L., Chattha, H. K., & Brownlee, K. (2006). Concurrent and predictive validity of the Psychopathy Checklist: Youth version across gender and ethnicity. *Psychological Assessment*, 18(4), 393–401.
- Sechrest, L. (1963). Incremental validity: A recommendation. Educational and Psychological Measurement, 23, 153–158.
- Serin, R. C. (1996). Violent recidivism in criminal psychopaths. Law and Human Behavior, 20(2), 207–217.
- Serin, R. C., & Amos, N. L. (1995). The role of psychopathy in the assessment of dangerousness. *International Journal of Law and Psychiatry*, 18(2), 231–238.
- Serin, R. C., Peters, R. D., & Barbaree, H. E. (1990). Predictors of psychopathy and release outcome in a criminal population. *Psychological Assessment*, 2(4), 419–422.
- Shah, S. A. (1978). Dangerousness and mental illness: Some conceptual, prediction, and policy dilemmas. In C. Frederick (Ed.), *Dangerous behavior: A problem in law and mental health* (pp. 153–191). Washington, DC: U.S. Government Printing Office.
- Silverthorn, P., Frick, P. J., & Reynolds, R. (2001). Timing of onset and correlates of severe conduct problems in adjudicated girls and boys. *Journal of Psychopathology and Behavioral Assessment*, 23, 171–181.
- Singh, J. P., Grann, M., & Fazel, S. (2011). A comparative study of violence risk assessment tools: A systematic review and meta-regression analysis of 68 studies involving 25,980 participants. *Clinical Psychology Review*, 31(3), 499–513.
- Skeem, J. L., & Cooke, D. J. (2010). Is criminal behavior a central component of psychopathy?: Conceptual directions for resolving the debate. *Psychological As*sessment, 22(2), 433–445.
- Skeem, J. L., Monahan, J., & Mulvey, E. P. (2002). Psy-

chopathy, treatment involvement, and subsequent violence among civil psychiatric patients. *Law and Human Behavior*, 26, 577–603.

- Skeem, J. L., & Mulvey, E. P. (2001). Psychopathy and community violence among civil psychiatric patients: Results from the MacArthur Violence Risk Assessment study. *Journal of Consulting and Clinical Psychology*, 69(3), 358–374.
- Skeem, J. L., Mulvey, E. P., & Grisso, T. (2003). Applicability of traditional and revised models of psychopathy to the Psychopathy Checklist: Screening Version. *Psychological Assessment*, 15(1), 41–55.
- Skeem, J. L., Poythress, N., Edens, J. F., Lilienfeld, S. O., & Cale, E. M. (2003). Psychopathic personality or personalities?: Exploring potential variants of psychopathy and their implications for risk assessment. *Aggression and Violent Behavior*, 8(5), 513–546.
- Smith, S. T., Edens, J. F., & McDermott, B. E. (2013). Fearless dominance and self-centered impulsivity interact to predict predatory aggression among forensic psychiatric inpatients. *International Journal of Foren*sic Mental Health, 12(1), 33–41.
- Steadman, H. J., Monahan, J., Appelbaum, P. S., Grisso, T., Mulvey, E. P., Roth, L. H., et al. (1994). Designing a new generation of risk assessment research. In J. Monahan & H. J. Steadman (Eds.), Violence and mental disorder: Developments in risk assessment (pp. 297–318). Chicago: University of Chicago Press.
- Stockdale, K. C., Olver, M. E., & Wong, S. P. (2010). The Psychopathy Checklist: Youth Version and adolescent and adult recidivism: Considerations with respect to gender, ethnicity, and age. *Psychological Assessment*, 22(4), 768–781.
- Sturup, J., Edens, J. F., Sörman, K., Karlberg, D., Fredriksson, B., & Kristiansson, M. (2014). Field reliability of the Psychopathy Checklist—Revised among life sentenced prisoners in Sweden. Law and Human Behavior, 38(4), 315–324.
- Tengstrom, A., Hodgins, S., Grann, M., Langstrom, N., & Kullgren, G. (2004). Schizophrenia and criminal offending: The role of psychopathy and substance use disorders. Criminal Justice and Behavior, 31, 367–391.
- Tikkanen, R., Auvinen-Lintunen, L., Ducci, F., Sjöberg, R. L., Goldman, D., Tiihonen, J., et al. (2011). Psychopathy, PCL-R, and MAOA genotype as predictors of violent reconvictions. *Psychiatry Research*, 185(3), 382–386.
- Toupin, J., Mercier, H., Dery, M., Cote, G., & Hodgins, S. (1996). Validity of the PCL-R for adolescents. In D. J. Cooke, A. E. Forth, J. P. Newman, & R. D. Hare (Eds.), Issues in criminological and legal psychology: No. 24. International perspectives on psychopathy (pp. 143–145). Leicester, UK: British Psychological Society.
- U.S. Department of Health and Human Services. (2001). Mental health: A report of the Surgeon General. Rockville, MD: Author.
- Vachon, D. D., Lynam, D. R., Loeber, R., & Stouthamer-Loeber, M. (2012). Generalizing the nomological

network of psychopathy across populations differing on race and conviction status. *Journal of Abnormal Psychology*, 121, 263–269.

- Vaughn, M. G., Edens, J. F., Howard, M. O., & Smith, S. (2009). An investigation of primary and secondary psychopathy in a statewide sample of incarcerated youth. Youth Violence and Juvenile Justice, 7(3), 172–188.
- Viljoen, J. L., Elkovitch, N., Scalora, M. J., & Ullman, D. (2009). Assessment of reoffense risk in adolescents who have committed sexual offenses: Predictive validity of the ERASOR, PCL:YV, YLS/CMI, and Static-99. Criminal Justice and Behavior, 36(10), 981–1000.
- Vincent, G. M., Kimonis, E., & Clark, A. (2016). Juvenile psychopathy: Appropriate and inappropriate uses in legal proceedings. In K. Heilbrun, D. DeMatteo, & N. Goldstein (Eds.), APA handbook of psychology and juvenile justice (pp. 197–232). Washington, DC: American Psychological Association.
- Vincent, G. M., Odgers, C. L., McCormick, A. V., & Corrado, R. R. (2008). The PCL:YV and recidivism in male and female juveniles: A follow-up into young adulthood. *International Journal of Law and Psychiatry*, 31(3), 287–296.
- Vincent, G. M., Vitacco, M. J., Grisso, T., & Corrado, R. R. (2003). Subtypes of adolescent offenders: Affective traits and antisocial behavior patterns. *Behavioral Sciences and the Law*, 21, 695–712.
- Vitacco, M. J., Neumann, C. S., & Caldwell, M. F. (2010). Predicting antisocial behavior in high-risk male adolescents: Contributions of psychopathy and instrumental violence. *Criminal Justice and Behavior*, 37(8), 833–846.
- Vitacco, M. J., Neumann, C. S., & Jackson, R. L. (2005). Testing a four-factor model of psychopathy and its association with ethnicity, gender, intelligence, and violence. *Journal of Consulting and Clinical Psychol*ogy, 73(3), 466–476.
- Vitacco, M. J., Neumann, C. S., & Pardini, D. A. (2014). Predicting future criminal offending in a community-based sample of males using self-reported psychopathy. *Criminal Justice and Behavior*, 41(3), 345–363.
- Vitale, J. E., Smith, S. S., Brinkley, C. A., & Newman, J. P. (2002). The reliability and validity of the Psychopathy Checklist—Revised in a sample of female offenders. Criminal Justice and Behavior, 29, 202–231.
- Wallinius, M., Nilsson, T., Hofvander, B., Anckarsäter, H., & Stålenheim, G. (2012). Facets of psychopathy among mentally disordered offenders: Clinical comorbidity patterns and prediction of violent and criminal behavior. *Psychiatry Research*, 198(2), 279– 284.
- Walsh, Z. (2013). Psychopathy and criminal violence: The moderating effect of ethnicity. *Law and Human Behavior*, 37(5), 303–311.
- Walsh, Z., & Kosson, D. S. (2007). Psychopathy and violent crime: A prospective study of the influence of

socioeconomic status and ethnicity. *Law and Human* Behavior, 31(2), 209–229.

- Walsh, Z., Swogger, M. T., & Kosson, D. S. (2009). Psychopathy and instrumental violence: Facet level relationships. *Journal of Personality Disorders*, 23(4), 416–424.
- Walters, G. D. (2003a). Predicting criminal justice outcomes with the Psychopathy Checklist and Lifestyle Criminality Screening Form: A meta-analytic comparison. Behavioral Sciences and the Law, 21, 89–102.
- Walters, G. D. (2003b). Predicting institutional adjustment and recidivism with the Psychopathy Checklist factor scores: A meta-analysis. Law and Human Behavior, 27, 541–558.
- Walters, G. D. (2006). Risk-appraisal versus self-report in the prediction of criminal justice outcomes: A meta-analysis. Criminal Justice and Behavior, 33, 279–304.
- Walters, G. D. (2009). The Psychological Inventory of Criminal Thinking Styles and Psychopathy Checklist: Screening version as incrementally valid predictors of recidivism. *Law and Human Behavior*, 33(6), 497–505.
- Walters, G. D. (2012). Psychopathy and crime: Testing the incremental validity of PCL-R-measured psychopathy as a predictor of general and violent recidivism. Law and Human Behavior, 36(5), 404–412.
- Walters, G. D., & Heilbrun, K. (2010). Violence risk assessment and Facet 4 of the Psychopathy Checklist: Predicting institutional and community aggression in two forensic samples. Assessment, 17(2), 259–268.
- Walters, G. D., Knight, R. A., Grann, M., & Dahle, K. (2008). Incremental validity of the Psychopathy Checklist facet scores: Predicting release outcome in six samples. *Journal of Abnormal Psychology*, 117(2), 396–405.
- Wareham, J., Dembo, R., Poythress, N. G., Childs, K., & Schmeidler, J. (2009). A latent class factor approach to identifying subtypes of juvenile diversion youths based on psychopathic features. *Behavioral Sciences* and the Law, 27(1), 71–95.
- Webster, C. D., Douglas, K. S., Eaves, D., & Hart, S. D. (1997). HCR-20: Assessing Risk for Violence (Version 2). Burnaby, BC, Canada: Mental Health, Law, and Policy Institute, Simon Fraser University.
- Welsh, J. L., Schmidt, F., McKinnon, L., Chattha, H. K., & Meyers, J. R. (2008). A comparative study of adolescent risk assessment instruments: Predictive and incremental validity. Assessment, 15(1), 104–115.
- Williamson, S. E., Hare, R. D., & Wong, S. (1987). Violence: Criminal psychopaths and their victims. Canadian Journal of Behavioral Science, 19(4), 454–462.
- Wilson, C., & Douglas, K. S. (2009). Assessment of dangerousness. In C. Edwards (Ed.), *Encyclopedia of* forensic sciences (pp. 667–676). Hoboken, NJ: Wiley.
- Yang, M., Wong, S. P., & Coid, J. (2010). The efficacy of violence prediction: A meta-analytic comparison of nine risk assessment tools. *Psychological Bulletin*, 136, 740–767.

# CHAPTER 29

# Treatment of Adults and Juveniles with Psychopathy

DEVON L. L. POLASCHEK JENNIFER L. SKEEM

Psychopathy is a form of personality pathology associated with varying degrees of social harm, which makes treatment an important goal. Lack of agreement about what psychopathy is, what causes it, and whether it is modifiable challenges the development of effective treatments. But the biggest barrier to knowledge about prevention and treatment to date has been the notable lack of research on whether change can be achieved—either in the harmful behavior associated with psychopathy, or in the condition itself.

One explanation for this dearth of research is the belief that the question of treatability has already been answered (Salekin, 2002). Hervey Cleckley, the progenitor of modern conceptions of psychopathy, appeared resigned to the fruitlessness of the treatment enterprise: "We do not at present have any kind of psychotherapy that can be relied upon to change the psychopath fundamentally" (1976, p. 439). Others agreed with this perspective, although with some hope for the future: "Traditional types of group or individual psychotherapies have not been shown to be effective. Novel approaches to the problem are needed" (Ogloff, Wong, & Greenwood, 1990, p. 188). Still others have been more sanguine. For example, after reporting evidence that a therapeutic community program actually increased violent recidivism among psychopathic offenders, Rice, Harris, and Cormier (1992) noted that "although there are no outcome data with adult psychopaths, one could predict on the basis of differential association theory that programs that involve highly structured interaction with prosocial models who demonstrate anticriminal attitudes and ways of thinking would be a more promising treatment approach" (p. 409). Interestingly, with this speculation, Rice and colleagues foreshadowed some of today's promising interventions.

Other obstacles to accumulating research evidence are more practical. In particular, it has been difficult to study psychopathy and treatment in adults (or youth) for measurement reasons. The vast bulk of research on psychopathy has been conducted with offenders using the Hare psychopathy inventories, which include the Psychopathy Checklist—Revised (PCL-R), the Psychopathy Checklist: Youth Version (PCL:YV), and the Psychopathy Checklist: Screening Version (PCL:SV; for a review of these measures, see Hare, Neumann, & Mokros, Chapter 3, this volume). Heavy reliance on these scales underrepresents heterogeneity among highscoring offenders (e.g., differences in anxiety, fearfulness, emotional reactivity) that may have important implications for treatment, and has profoundly confounded the specific personality pathology of psychopathy with general factors related to criminal propensity. More broadly, the lack of psychopathy instruments that are sensitive to change and basic methodological problems in measuring treatment-related change in offender samples (e.g., measurement of variables not linked to recidivism, lack of reliable measurement tools, lack of comparison groups) pose particular challenges.

In this chapter, we review available published studies that have directly addressed the treatability of high-psychopathic individuals. The pool of such studies is limited, but findings from these investigations paint a relatively optimistic picture. Before reviewing these findings, we contextualize work to be reviewed by noting that conclusions of "nothing works with psychopaths" echo broader conclusions reached prior to the late 1980s regarding the treatment of criminal offenders in general. Since that time, research by an influential group of Canadian psychologists has convincingly demonstrated that some treatments do indeed "work" to reduce risk for recidivism.

# Effective Treatments with Criminal Offenders

Over the past quarter-century, a series of systematic statistical examinations of controlled intervention studies with offenders has identified elements of treatment that predict reductions in recidivism. Based on findings from these studies, offenders in general have begun to be regarded as treatable, with a steady growth of methodologically sound evaluation research feeding into a body of metaanalyses demonstrating that criminal risk can be reduced with effective treatments. In recent years, this literature has been dominated by offense-focused cognitive-behavioral, group-based interventions, but many other types of interventions have also shown effectiveness.

These meta-analyses have been used to establish a series of principles for the provision of programs and psychological treatments for offenders. Dissemination of this knowledge to correctional administrators and program providers has been enhanced by Andrews and Bonta's (2010; Bonta & Andrews, 2016) efforts to package these principles into what is now known as the RNR ("riskneed-responsivity") model of offender treatment. Although the model includes 18 principles (all of which are important), these first three are the most familiar and are the focus here (Andrews, Bonta, & Hoge, 1990).

Put simply, treatment programs for offenders yield the largest reductions in criminal behavior

when they (1) target relatively intensive services toward higher-risk offenders (the *Risk* principle), leaving lower-risk offenders with little or no therapeutic attention, (2) focus treatment services on changing empirically documented risk factors for crime (e.g., criminal attitudes, substance abuse, impulsivity), termed "criminogenic needs" (the *Need* principle), and (3) deliver interventions in a manner that maximizes offenders' engagement in the treatment process and ability to use the treatment services to make changes (the *Responsivity* principle; Andrews et al., 1990; Andrews & Bonta, 2010; Bonta & Andrews, 2016).

Ideally, according to the RNR model, warm, enthusiastic, respectful, well-trained and wellsupervised therapists spend considerable time using the most effective cognitive and behavioral techniques to work with higher risk offenders to change criminal risk factors (Bonta & Andrews, 2016). When clients demonstrate characteristics that challenge engagement and change-and if higher-risk clients have been chosen, they usually will-these therapists endeavor to work with the difficult characteristics (e.g., hostility, poor motivation, poor learning), rather than taking them as indicators that the client is not suitable for treatment. This attitude about "difficult clients" is important because a number of these same characteristics that disrupt the process of treatment also contribute to offense risk, making them more prominent in the very clients who are the highest priority for treatment.

In general, the more programs adhere to the RNR model's principles, the larger the reductions overall in reconviction risk. The impact on crime for those adhering to all three principles is modest but important, with reported effect sizes ranging from 0.15 to 0.34 (Andrews & Bonta, 2010). Even an effect size of 0.15 is notable. For example, if 50% of untreated offenders had been reconvicted at follow-up, the corresponding rate for treated offenders given a 0.15 effect would be 35%—a relative reduction of more than 30%. But what is the more specific relevance of these findings to understanding research on psychopathy and treatment? As noted earlier, psychopathy in offenders usually refers to high scores on one of the Hare psychopathy inventories. These same scores are indicative of the level of criminal risk the offender poses (Douglas, Vincent, & Edens, Chapter 28, this volume). Although designed to measure and diagnose psychopathy, the PCL-R/PCL:SV's popularity with adult offenders is especially due to its utility in assessing risk of violent and other criminal behavior (Skeem, Polaschek, Patrick, & Lilienfeld, 2011). PCL-R scores are about as accurate in risk prediction as purpose-built risk assessment inventories that do not index psychopathy at all (see Singh, Grann, & Fazel, 2011; Yang, Wong, & Coid, 2010).

So, in accordance with the risk principle (Andrews & Bonta, 2010), high-PCL-scoring clients are high-risk offenders and should be among those most highly prioritized for intensive intervention rather than being considered ineligible for intervention because they are difficult to treat (Skeem, Polaschek, & Manchak, 2009). However, this correlation between PCL scores and criminality does not mean that psychopathy and criminal deviancy are synonymous. Although some researchers and clinicians tend to equate the two, our view is that this overlap reflects a consequence of the design of the PCL inventories rather than an inherent feature of psychopathy itself, a point to which we return later.

### Treatment of Adults with Psychopathy

### Effects on Violence and Other Criminal Behavior

Three studies of adult offenders have examined directly whether treatment reduces violent and other criminal behavior of psychopathic individuals, and the results of all three are positive. In a study that is unique for being conducted outside the criminal justice system, intensive treatment of civil psychiatric patients reduced violence regardless of PCL-R score (i.e., psychopathy did not moderate the effect of treatment; Skeem, Monahan, & Mulvey, 2002). High-PCL-scoring individuals who had completed fewer than six treatment sessions in the previous 10 weeks were 3.5 times more likely to be violent in the next 10 weeks than those who attended more sessions (even after researchers controlled for the treatment assignment process). Treatment in this study was "psychiatric treatment as usual." The modal intervention was psychotherapy combined with psychotropic medication; the extent to which services could be characterized by RNR principles is unclear.

In the first of two correctional studies, graduates of an intensive RNR-based program for high-risk, violent adult prisoners (PCL:SV; M = 17.8) showed reductions in general and violent offending compared to matched untreated controls (Polaschek, 2011). And as in the Skeem and colleagues (2002) study, psychopathy scores—in this case, based on the PCL:SV—were unrelated to violent reconviction (r = .05; Polaschek, 2008).

A second criminal justice study compared outcomes for two groups: (1) offenders with PCL-R scores above 25 (n = 32), who completed the Correctional Service of Canada's Aggressive Behavior Control program, and (2) offenders matched for PCL-R Factor 1 and Factor 2 scores along with race and age at first conviction (n = 32), who received services as usual. Both samples had a very high base rate of subsequent convictions, and no significant differences were found on measures of recidivism per se (e.g., any reconviction, time to first reconviction). Given the small sample size, and the high rate of reoffending-an expected and common problem with high-risk offender outcome studies-sentencing indices were also examined as a proxy for new offense seriousness. On average, men who completed the Aggressive Behavior Control program received less severe sentences according to all indices, with group differences reaching statistical significance for the three most serious indices-longest sentence length, longest aggregate sentence, and total aggregated sentence length (Wong, Gordon, Gu, Lewis, & Olver, 2012). Thus, the two groups did not differ significantly on most outcome indices, but the most severe outcomes showed an effect in favor of treatment, especially when aggregated.

The results of these studies stand in contrast to those obtained in an evaluation of an experimental treatment program conducted in the 1960s. In this study, psychopathic offenders who received treatment while hospitalized at the Oak Ridge unit in Penetanguishene, Canada (n = 46) showed higher rates of violent (but not general) recidivism following release than a sample of untreated high-psychopathy prisoners matched on criminal history variables but not specifically on PCL-R scores (Harris, Rice, & Cormier, 1994). However, the treatment to which offender patients were subjected in this study was highly unconventional and ethically unacceptable by today's standards (e.g., limited staff oversight of patients who were forced to spend days together naked in "encounter bubbles" with wall-mounted feeding tubes, having been administered various psychoactive substances including alcohol, methedrine, and LSD [lysergic acid diethylamide], for the purpose of "breaking through psychic defenses").

Certain aspects of the "treatment" procedure evaluated in this study could well have contributed to the adverse outcomes reported. One source of harm may have been the punitive and nonvoluntary elements of the regimen. Patients were punished for not complying with program requirements but could not leave the program of their own accord. As evidence for this argument, time spent being punished for noncompliant behavior in treatment was correlated with later convictions for violent crimes, regardless of whether patients were psychopathic. Unsurprisingly, high-psychopathy offenders were judged to be more difficult patients; they were punished more, spent more time locked in bare cells on their own, and received more potentially harmful drugs (Rice et al., 1992). These experiences may simply have made them more angry and hostile-potential risk factors for new violence (Skeem et al., 2009). Thus, although the Rice and colleagues (1992) study provides corroborating evidence that psychopathy is associated with more challenges to the treatment process (e.g., noncompliance), and that programs can increase the risk of recidivism, at least in some clientele, it is silent on the issue of whether treatments that are generally effective in reducing violence are also effective for individuals with psychopathy (Polaschek, 2015).

Another challenge to the limited treatability literature reviewed earlier is that none of the three studies was a randomized controlled trial. No study of this type investigating psychopathic offenders' responses to empirically validated treatment has yet been published. Some reviewers conclude that with the absence of randomized controlled trial studies to date, there remains no convincing evidence that psychopathic offenders can benefit from treatment (Harris & Rice, 2006). However, we consider this stance to be unduly conservative. Several meta-analyses of intervention protocols for high-risk offenders have found little or no difference in effect sizes for randomized versus high-quality quasi-experimental designs (for a review, see Hollin, 2008). The studies reviewed in this chapter are high-quality, quasi-experimental designs that apply several credible methods to estimate treatment response (e.g., inclusion of treatment noncompleters in analyses; case-matching on criminal risk; use of propensity scores to statistically control for nonrandom assignment to treatment and comparison groups). In our view, these studies are rigorous enough to challenge lingering beliefs that the risk for commission of new crime by high-psychopathy offenders is impervious to intervention. Furthermore, these studies document that following treatment, PCL-defined psychopathy no longer predicts outcomes, despite its ability to do so in the absence of treatment. However, such outcome studies are rare at this point, and those that are available do not shed light on why or how treatment completion leads to reduced reconviction (Kroner & Yessine, 2013). Beyond this need, it will be important to show that basic psychopathic tendencies are amenable to change, and that these changes relate to improved long-term outcomes.

### Effects on Risk Factors for Recidivism

Studies reviewed in this section address the question of whether there is evidence that the mechanism for change in recidivism outcomes for psychopathic offenders is improvement in areas targeted by treatment—specifically, those linked to risk of reconviction. We refer to treatment targets here as *variable risk factors* (see Monahan & Skeem, 2014); but in the language of the RNR model, they are referred to as *criminogenic needs* or *dynamic risk factors* (Bonta & Andrews, 2016).

Studies that assess relations between change in these factors (i.e., after vs. before treatment) and the subsequent recidivism of psychopathic offenders are few. Instead, research to date has been preoccupied with whether PCL scores per se are correlated with treatment "success" variables that may not index within-person change (e.g., homework completion, quality of offense cycle or relapse prevention plans) and also may not themselves be predictive of recidivism (Langton, Barbaree, Harkins, & Peacock, 2006; Looman, Abracen, Serin, & Marquis, 2005; Seto & Barbaree, 1999). As high-risk offenders, those with psychopathy would be expected to commence treatment with poorer scores on treatment targets because these targets cumulatively comprise that risk. Studies that do not compare reassessments following treatment with baseline measurements prior to treatment cannot answer the more important question of whether any offenders have benefited from intervention. And even if higher PCL scorers make more change than lower-risk offenders, they still may remain more problematic at treatment's end, by virtue of retaining higher scores on risk-related problems because their scores started much higher.

Two studies to date have successfully used a purpose-designed offender change measure to demonstrate that change in individuals with psychopathy can be greater in those who avoid reconviction after treatment. In both studies, trained raters retrospectively scored a version of the Violence Risk Scale (VRS: Wong & Gordon, 2006; VRS-SO [Sex Offender version]: Wong, Olver, Nicholaichuk, & Gordon, 2003), after extracting relevant information from file records at two time points (beginning and end of intervention). Raters were blind to recidivism outcomes. The VRS is highly useful for evaluating the effects of treatment on variable risk factors because it (1) actuarially assesses initial level of risk on each of a large array of variable risk factors (e.g., sexual preoccupation, substance abuse, impulsivity, criminal attitudes); (2) determines, for each offender, which risk factors are treatment goals; (3) measures progress against these goals; and (4) aggregates indices of progress into a change score that estimates how much risk reduction occurred from the start to the end of treatment.

Olver and Wong (2009) found that psychopathic men in an intensive high-risk sex offender program were judged over the course of treatment to have made measurable progress on the VRS-SO's risk-related treatment targets. Most compellingly, the more these offenders changed, the less likely they were to be reconvicted of sexual and violent offenses. A second study from this research group focused on serious high-risk violent offenders (PCL-R M = 26). Paralleling results from the earlier study of sex offenders, the more that these predominantly psychopathic offenders changed in VRS risk factors over treatment, the less likely they were to be reconvicted for violent offenses (Lewis, Olver, & Wong, 2013).

These two studies, then, document change in PCL-psychopathic offenders during treatment, then statistically link that improvement to actual reductions in serious criminal outcomes. One obvious limitation of these studies is that there is no untreated comparison group; we therefore cannot be certain the change is a consequence of program attendance. However, elsewhere, there is evidence that both programs produced change. Outcome evaluations showed that attendance was associated with reduced recidivism relative to an untreated comparison group (Olver & Wong, 2013; Wong et al., 2012). Although untreated comparison subjects were not assessed for change in VRS risk factors, the comparative reduction in recidivism for treated individuals is indicative of program impact.

In conjunction with the recidivism results described in the preceding paragraphs, these studies of treatment-related change suggest that PCLpsychopathic offenders can indeed be effectively treated through intensive services, that effective treatment can reduce risk, and that effective treatment renders PCL scores irrelevant as indicators of outcome. Although the current pool of relevant research is certainly small, it is clear that this topic is worthy of ongoing systematic investigation.

### Effects on the Process of Treatment

We noted in the opening of this chapter that individuals with psychopathy have been viewed as untreatable. Yet the research on their treatability in criminal justice settings makes it clear that there is no empirical justification for this conclusion; available research indicates that high-psychopathic individuals, just like other high-risk offenders, can benefit from treatment focused on modifying variable risk factors. In fact, this research seems to argue that psychopathic individuals should be regarded as high-risk offenders—difficult, highneed, complex cases for sure—but not distinctly impervious to treatment.

However, for many therapists, treatability is not just about outcome-it encompasses other important considerations as well. For example, therapists may believe that to make changes, clients need to be willing and able to engage with the intervention being offered. A treatment program has little value if most of the target clients refuse the opportunity to attend, start but fail to complete the process, or complete it but without appreciable benefit. And in more conventional psychotherapy contexts, client treatability may be judged on the basis of psychological mindedness (Farber, 1989), compliance with therapist direction, or simply verbal fluency (e.g., young, attractive, verbal, intelligent, skilled [YAVIS] clients; cf. Polaschek, 2010; Wormith & Olver, 2002).

Just as classroom teachers may regard hostile, noncompliant, and egocentric students as "unteachable" even if they attain passing grades, psychotherapists may similarly base ideas about treatability on their experiences of a challenging therapy *process* with the client, that is, on perceived readiness of an offender for treatment and treatment responsivity. In fact, treatment progress—in the context of ongoing challenges to the therapeutic process—may be particularly likely to go unnoticed in difficult offender cases when therapists have no objective pre–post measures of client progress, and when challenging referrals are mixed with more immediately acquiescent clients.

There is no doubt that high-risk offenders can be construed as relatively untreatable by a therapist who does not find a challenging treatment process enjoyable. An extensive research base separate from published work using the PCL scales-identifies characteristics of offenders that emerge with increasing levels of criminal risk. As risk increases, the overall picture is one of mounting treatment-impeding behavior, with risk factors manifesting themselves in the treatment process itself. High-risk offenders are often angry and irritable, prone to feeling victimized, suspicious of others' motives, antagonistic, aggressive, untrustworthy, egocentric, noncompliant, and uncommitted to change (Blackburn, 1999; Krueger et al., 1994; Lowenkamp & Latessa, 2004; Moffitt, 2003; Ross, Fabiano, & Ewles, 1988). The central concern of crime-reducing therapies is helping offenders learn new skills, but higher risk offenders make poor "students." They do not persist with treatment when they find tasks hard. They lack self-reflection and self-control (Cale, 2006). To make matters worse, high-risk offenders are known to exhibit high rates of verbal ability deficits, along with neuropsychological impairments, a history of school failure, and negative attitudes toward new learning (Golden, Jackson, Peterson-Rohne, & Gontkovsky, 1996; Moffitt, Lynam, & Silva, 1994). These findings suggest that a range of complications associated with criminal risk alone (impaired self-control, learning, trust, motivation, etc.) may be sufficient to explain why offenders identified as high-risk on the basis of PCL-psychopathy scores will be experienced as difficult to treat.

In a similar vein, PCL scores show direct associations with a range of negative personal characteristics relevant to treatment. Individuals with high PCL scores tend to be evasive, verbally combative, hostile, prevaricating, disruptive and less ready to change, less committed to adjunct activities such as work and education, and more likely to be removed from, or leave treatment prematurely, compared to lower-scoring offenders (Alterman, Rutherford, Cacciola, McKay, & Boardman, 1998; Caldwell, McCormick, Umstead, & van Rybroek, 2007; Chakhssi, de Ruiter, & Bernstein, 2010; Hildebrand, de Ruiter, & de Vogel, 2004; Hobson, Shine, & Roberts, 2000; Ogloff et al., 1990; Olver & Wong, 2009; Olver, Wong, Nicholaichuk, & Gordon, 2007; Rice et al., 1992; Richards, Casey, & Lucente, 2003; Seto & Barbaree, 1999; Taft, Murphy, Musser, & Remington, 2004; see also Salekin, Worley, & Grimes, 2010). However, it bears repeating (see studies reviewed earlier) that PCL scores themselves do not predict treatment outcome, further highlighting the importance of distinguishing between therapists' subjective experience of the process of treating psychopathic offenders and well-anchored judgments of whether offenders benefit when treated. Additionally, researchers examining both treatment process and outcome have not yet tried to separate psychopathy as a form of personality pathology from criminal risk. For example, researchers to date have not controlled for scores on a general risk assessment inventory to examine whether PCL scores—particularly Factor 1 scores, which are most distinctively characteristic of psychopathy—add incremental validity in predicting treatment challenges and gains.

To conclude, although research indicates that offenders with high PCL scores tend to challenge the treatment process, the extant evidence shows they still profit in general from that treatment, and there is no support for the view that psychopathic traits per se pose any unique problems for treatment beyond features generally associated with high criminal risk.

### Effects on Psychopathic Traits

In the criminal justice system, the top priorities for intervention should be to reduce criminal offending and increase community safety. But as we noted at the outset, psychopathy is personality pathology, and thus worthy of therapeutic attention in its own right—that is, aside from its interface with criminal justice concerns. Is there any direct evidence that traits associated with the clinical condition of psychopathy change as a function of treatment?

With adults, we have found no methodologically sound research demonstrating change in symptoms of psychopathy as a function of treatment. In fact, we have found no research that addresses this issue explicitly, and there is no validated measure designed to index such change, though promising new interview-based approaches are under development (e.g., Comprehensive Assessment of Psychopathic Personality [CAPP]; Cooke, Hart, Logan, & Michie, 2012; Cooke & Logan, Chapter 9, this volume), and self-report inventories may hold potential to serve as monitors of treatment change. In a single study with younger people, Caldwell, McCormick, Wolfe, and Umstead (2012) reported encouraging evidence for treatment-induced reductions in scores on the Antisocial Process Screening Device (APSD; Frick & Hare, 2001), a teacher- and parent-rated measure. Specifically, changes in scores on the APSD as a whole and on each of its subscales (Callous-Unemotional, Narcissism, Impulsivity) correlated with improvements in institutional and treatment behavior. However, this study lacked a comparison group; therefore, observed changes could not be clearly attributed to the treatment itself.

In contrast to approaches based on the RNR principles, Baskin-Sommers, Curtin, and Newman (2015) took an innovative psychopathology-based approach, applying a brief cognitive remediation treatment to a core mechanism in psychopathy: the tendency to allocate insufficient attention to affective stimuli that are outside the scope of current goals. This deficit has been referred to as a problem of attention to context, or the response modulation hypothesis. Baskin-Sommers and colleagues had high-PCL offenders take part in six weekly, hour-long sessions, in each of which they completed three computerized tasks. After training, they showed improvement on not only the trained tasks but also on similar untrained tasks administered before and after the treatment. High-PCL prisoners who completed a different type of intervention not related to this deficit did not show similar improvements, nor did a sample of prisoners with a different type of cognitive-affective deficit but given the psychopathy-specific intervention. The study is preliminary: Evidence for the response modulation hypothesis on which it is based is, at best, mixed (Skeem et al., 2011); the study does not connect training-related change to outside behavioral change, symptom evaluation, or recidivism; any direct effects on psychopathic traits are unknown. However, this work provides evidence for a novel experimental treatment approach that may merit further investigation and serves to link this clinical condition to the growing body of research on cognitive remediation of psychopathology (Onken, 2015)

There is certainly value to society in reducing the severity of the underlying personality pathology in psychopathy, if such an aim is achievable. Many therapists are concerned with not only reducing the capacity for criminal harm but also ameliorating other serious harm that their clients can inflict. As an example: A man who is seeking to reduce his perpetration of domestic violence may proudly declare that instead of hitting his partner during a fight, he has progressed to punching the wall beside her head. Although likely to result in less physical injury, this "progress" remains problematic with regard to the partner's overall psychological well-being. Should treatment stop there, though, given that he is no longer committing a crime?

Older interventions for psychopathy, while probably largely ineffective, were primarily conducted as mental health treatments, concerned with treatment aims rather broader than the current focus on reducing criminal offending risk (Salekin, 2002). However, even in mental health settings, treatment of psychopathy has received scant research attention, particularly in recent years (Galietta & Rosenfeld, 2012). In several services, experimental programs are underway that entail a broader personality pathology focus (e.g., based on Young and colleagues' schema therapy [Bernstein et al., 2012; Young, Klosko, & Weishaar, 2003], or using a cognitive–interpersonal approach [Saradjian, Murphy, & McVey, 2013]), though outcome data are not yet available.

At present, risk reduction treatment in criminal justice settings remains by far the most common therapy offered to psychopathic offenders, and it recognizes a distinction between changing behavior and changing personality traits (e.g., Polaschek & Kilgour, 2013; Tew & Atkinson, 2013; Wilson, Kilgour, & Polaschek, 2013; Wong, 2013; Wong et al., 2012). Though not yet empirically founded, this dichotomy has intuitive appeal for at least two reasons. First, treatment referrals in the criminal justice system are usually directed at changing crime-related behaviors rather than personality characteristics. Second, traits are assumed to be intractable; for example, Wong (2000) argued that "it is unrealistic to try to change the psychopath's personality structure" (p. 99), leading some to recommend that therapists should work around psychopathic traits rather than targeting them directly (Doren, 1987; Wong, 2000; Wong & Hare, 2005).

Correctional psychologist Stephen Wong, an expert on the treatment of psychopathy in custodial settings, recently proposed a two-component model for the treatment of psychopathy that reflects this distinction (Wong, 2013; Wong et al., 2012). Wong conceptualizes psychopathy as it is measured and defined by the PCL-R, and his two components are based on the view that the two subscales of the PCL-R respectively index the basic personality traits of psychopathy (Factor 1 [F1]) and the chronically antisocial and unstable behaviors associated with the condition (Factor 2 [F2]).

Based on these two symptomatic factors, Wong and colleagues propose that treatment should be envisioned as comprising an interpersonal component (treatment-interfering behaviors) and a criminogenic component (variable risk factors for crime, including violence). Effective treatment *manages* the F1 characteristics (see Wong & Hare, 2005, for practical strategies) to enable riskreducing *change* in the F2 characteristics. Wong and colleagues (2012; Wong, 2013) argue logically that reducing F2 scores effectively reduces PCLpsychopathy scores overall, and hence is a viable focus of treatment for psychopathy. They note further that F2 scores are static proxies for extended antisocial propensity, consistent with the superiority of F2 in predicting criminal outcomes and violence (Skeem et al., 2011), and conclude that the empirical evidence supports the focus on changing F2-related factors as a means for reducing recidivism.

The simplicity of this model is likely to give it significant heuristic appeal for therapists. However, the model makes a number of questionable assumptions. First, the PCL-R is an inventory for assessing psychopathy, and Wong's model treats it as synonymous with the construct of psychopathy itself. Others in the field have pointed out that clarification of what the essential components of psychopathy comprise requires consideration of a richer range of sources than the factor structure of a single assessment device (Patrick & Drislane, 2015; Skeem et al., 2011). Second, PCL F2 characteristics are very unlikely to be unique to offenders with psychopathy. Studies of the heterogeneity of offenders with antisocial personality disorder indicate that a range of personality characteristics is associated with a chronically unstable and antisocial lifestyle (Poythress et al., 2010), not all of which are F1 characteristics. In fact, PCL F2 appears to be largely indicative of general disinhibition (Patrick, Hicks, Krueger, & Lang, 2005; Skeem et al., 2011), which in turn is associated with personality characteristics other than those operationalized in F1. Therefore, reductions in F2, while statistically reducing overall PCL-R scores, do not necessarily correspond to reductions in psychopathy; therefore, the treatment of F2 is not the treatment of psychopathy per se.

Last, Wong (2013) notes that it is F2 that should be prioritized for treatment, since it carries most of the unique predictive power of the PCL-R for crime and violence, a view well supported by recent meta-analyses (e.g., Kennealy, Skeem, Walters, & Camp, 2010; Yang et al., 2010). Wong proposes that treatment-interfering behaviors arise from F1 characteristics. However, F2 and F1 correlate about 0.5, indicating that statistically they share about a quarter of their variance. One clinical consequence of this overlap may be that by working around, or *managing* rather than attempting to change F1 tendencies, therapists will avoid some important potential mechanisms for indirectly influencing F2 characteristics. Furthermore, even if therapists avoid engaging with F1 tendencies as targets for treatment, various treatment-interfering behaviors occurring in the intervention context are, as discussed earlier, manifestations of risk factors for crime and violence.

Studies cited by Wong as supporting the importance of F1 as a source of treatment-interfering behavior actually focus mainly on total PCL-R scores rather than disaggregating by factor scores. The sole exception, a study by Hobson and colleagues (2000), did not show that F1 is more associated with treatment disruption than F2. In fact, high levels of disinhibitory tendencies associated with F2 can certainly lead to what Wong refers to as "Offence Analog Behaviors" (Wong, 2013, p. 6-15)-manifestations of criminal behavioral processes that are seen in the treatment context. Examples of F2-related behaviors that could disrupt the treatment process include affective dysregulation, self-harm, substance abuse, and attempts to manage anxiety by dominating and intimidating others in group. These behaviors are likely to be underpinned by their own difficult-to-change personality traits (Poythress et al., 2010). In view of these complexities, focusing on F2 characteristics will still require therapists to work to change, not just manage, disruptions to the treatment process.

Wong (2013) and colleagues (Olver & Wong, 2009; Wong et al., 2012) have done much to advance current understanding of the treatment of high-PCL-scoring offenders in custodial settings. Their two-component model may have several beneficial influences on practice with psychopathic individuals-for example, encouraging therapists to think more clearly about achievable goals in treatment, and to develop a matter-of-fact attitude to working with treatment disruptionbut the model should be regarded as a rubric rather than a rehabilitation theory and should not preclude more nuanced empirical investigations of the treatment of psychopathy. Wong and colleagues have provided some very helpful guidelines for treatment, but in our opinion, these guidelines are best viewed as directed toward the criminal risk-reducing treatment of psychopathic individuals, not the treatment of psychopathy in its essence. By making this distinction, we preserve the important boundaries between personality pathology and criminal risk, and between an assessment measure and the construct it imperfectly operationalizes. More broadly, whether our approach to treatment should differ for psychopathic high-risk offenders versus high-risk offenders in general, and whether psychopathy itself can be treated, are fascinating questions that await further practice innovation and research.

Are core psychopathic traits intractable? Although this specific question remains to be answered, the prevailing view that dispositions are unchanging in adulthood continues to fuel arguments against the possibility of treating psychopathic traits (McCrae & Costa, 1994). However, this view is contradicted by more recent research. First, both longitudinal and cross-sectional studies show, for example, that self-control, warmth, and emotional stability tend to increase throughout adulthood (Roberts & Mroczek, 2008). Even for personality disorders, longitudinal improvement has been documented (Caspi, Roberts, & Shiner, 2005; Seivewright, Tyrer, & Johnson, 2002). A second argument is that newer treatments for putatively "intractable" conditions such as borderline personality disorder (BPD) have led to clinical improvements (Clarkin, Levy, Lenzenweger, & Kernberg 2007). Notably, psychopathy shows extensive comorbidity with other personality disorders (Kirkpatrick et al., 2010), including BPD (Newhill, Vaughn, & DeLisi, 2010). A third point is that some intensive treatment programs for high-risk offenders arguably already target psychopathy-relevant traits, if not intentionally. These programs focus on modifying various manifestations of risk factors (e.g., grandiosity and arrogance toward others, low empathy, callousness and lack of guilt, conning, lying to and manipulating others). Without concerted intervention, these features tend to function as relatively trait-like stable psychological characteristics (Mann, Hanson, & Thornton, 2010; Ward, Polaschek, & Beech, 2006). For example, characteristics such as these form the basis for ratings of offenders' treatment progress, using the VRS (Lewis et al., 2013). Progress in modifying variable risk factors may turn out to be progress in altering core psychopathic traits, perhaps beyond their overt behavioral manifestations.

### Variants of Psychopathy and Treatment

Although many types of psychopathy have been described, the most common subtypes are primary and secondary, based mainly on a theory articulated by Benjamin Karpman (1941), a contemporary of Cleckley. Karpman's clinically based theory has received some empirical support from recent cluster-analytic studies distinguishing subgroups among offenders high in psychopathy, as indexed by the PCL-R (see Hicks & Drislane, Chapter 13, this volume). Taken together, findings from these studies point to two subgroups (labeled "primary" and "secondary," respectively, by Skeem, Johansson, Andershed, Kerr, & Louden [2007], after Karpman [1941]), one similar to Cleckley's original description (i.e., emotionally resilient but shallow, and insensitive to others' feelings) and the other neurotic, prone to negative emotionality (anxiety, mood disorders, irritability), socially avoidant, reactively aggressive, and with high rates of childhood maltreatment.

Karpman (1941) speculated that individuals with secondary psychopathy would be more responsive to treatment than those with primary psychopathy. If Karpman's postulate were in fact correct, a failure to account for these variants in treatment research could dilute or conceal differential treatment effects. Only one empirical study to date, by Poythress and colleagues (2010), has examined differential treatment responsivity among psychopathy variants. These investigators identified subgroups among 193 offender residents from drug treatment facilities through a cluster analysis of variants consisting of PCL-R symptom facets, trait-scale scores, and reported abuse/ trauma history. They compared these subgroups with respect to treatment behavior, motivation for treatment, and treatment gain as assessed by counselor ratings. They found that offenders classified into a subgroup reflecting secondary psychopathy attended treatment more reliably and showed higher treatment motivation than offenders classified into a primary psychopathy subgroup, but no differences between these groups were found on disruptive behavior or skill mastery, or on the proportion of group members judged to be "treatment successes" (p. 396).

Related to these results, recent research with high-risk male prisoners from New Zealand suggests that secondary characteristics such as negative emotionality may be a surprisingly prominent feature of the treatment process for psychopathic offenders. Specifically, a substantial proportion (27%) of a sample of 198 men who scored in the psychopathic range on the PCL:SV (M = 19.4, 53% at or above 20) self-reported extensive psychopathology on the Millon Clinical Multiaxial Inventory (Millon, 1997), including both internalizing and externalizing symptoms (Polaschek, 2008). This pattern of results suggests that secondary psychopathy may be quite common in correctional settings, if not as common as primary psychopathy (characterized in this research by a lack of reported psychopathology other than antisocial/narcissistic symptoms and drug/alcohol abuse; cf. Sissons & Polaschek, 2017). In fact, a follow-up study of these participants revealed that those who exhibited anxiety during treatment were in the majority, based on independent ratings of treating therapists' notes (Daly & Polaschek, 2013).

Furthermore, in keeping with other research with both adults (Poythress et al., 2010) and adolescents (Kimonis, Skeem, Cauffman, & Dmitrieva, 2011), there is evidence that those offenders classified as having secondary psychopathy are more likely to reoffend following release than their primary psychopathy counterparts. Daly and Polaschek (2013) found that secondary psychopathic offenders, who showed modestly higher overall PCL:SV scores than primary psychopathic offenders (M = 21.4 vs. 20.1) as a function of significantly higher F2 scores (with no difference on F1), were rated as more anxious by their therapists and were more likely to be reconvicted following treatment. Intriguingly, therapists' ratings of anxiety in treatment predicted violent reconviction along with scores on PCL F2 (Daly & Polaschek, 2013). These results provide further evidence that consideration of psychopathy subtypes in treatment research can help to advance intervention efforts-for example, by guiding therapists and program designers in how to "tune in" better to heterogeneity among high-risk offenders and apply intervention strategies that fit with the relevant variability in responsivity and risk factors indicated by such heterogeneity.

### Treatment of High-Risk Juveniles with Psychopathic Features

As suggested earlier, a number of controlled studies indicate that adult offenders with psychopathic traits respond to well-designed, intensive treatment with reduced violence and other criminal behavior. As we show next, these conclusions seem to apply with even greater force to children and adolescents with antisocial behavior and psychopathic features, who are at risk for repeated involvement in the justice system (for a review, see Skeem, Scott, & Mulvey, 2014). In this section, we (1) highlight our conceptualization of these juveniles and (2) review rigorously designed treatment studies relevant to this group. We conclude the chapter by summarizing major questions for future research and policy, first for youth, then for adults.

### **Conceptualization and Terminology**

Juvenile psychopathy has been studied in two overlapping but distinguishable ways (Skeem, Manchak, Lidz, & Mulvey, 2012): (1) as its own entity, using measures that extend the PCL-R downward, developmentally (e.g., the PCL:YV, Forth, Kosson, & Hare, 2003) and (2) as a subtype of conduct disorder, using measures of "callous-unemotional" features (i.e., deficient empathy, guilt, caring, and poverty in emotional expression; see Frick, Ray, Thornton, & Kahn, 2014). Both approaches include externalizing-antisocial behavior ("Factor 2") and interpersonal-affective features that are more specific to psychopathy ("Factor 1"). For the purpose of this review, our definition of psychopathy encompasses both approaches because both identify high-risk juveniles (i.e., young people at risk for violence and other antisocial behavior; for a review, see Skeem et al., 2012). For example, scores on the PCL:YV are strongly associated with, and tend to predict recidivism as effectively as, scores on purpose-built risk assessment tools (e.g., Edens, Campbell, & Weir, 2007; Hilterman, Nicholls, & van Nieuwenhuizen, 2013).

Although it tends to be assumed that high-risk youth represent "the most hardened and least likely to respond to treatment" (Lipsey, Wilson, & Cothern, 2000, p.6), there is little support for this assumption. In fact, as compelling evidence to the contrary, Lipsey (2009) concluded from a metaanalysis of 548 controlled studies of programs for adolescent offenders published before 2002 that "there was no indication that there were juveniles whose risk level was so high that they did not respond to effective interventions" (Lipsey, Howell, & Kelly, 2010, p. 23). Instead, meta-analytic evidence indicates that core principles of effective correctional services for antisocial behavior-including the risk principle-generalize to young people (for a review, see Skeem et al., 2014).

Similarly, there is little support for the notion that "psychopathic" juveniles are a homogeneous group marked by qualitatively distinctive causal processes that inevitably lead to persistence of offending into adulthood (for reviews, see Frick et al., 2014; Skeem et al., 2012, 2014). For example, the weight of evidence using taxometric techniques indicates that psychopathy is a dimensional trait or configuration of traits rather than a discrete category (or taxon) that exists in nature (see Edens, Marcus, & Vaughan, 2011; Skeem et al., 2012). Measures of juvenile psychopathy predict short-term recidivism much better than they do offending into adulthood (Olver, Stockdale & Wong, 2012; Stockdale, Olver, & Wong, 2010). And, as detailed below, rigorous treatment research provides virtually no support for the "insinuation that callous–unemotional traits in childhood are more immutable than conduct disorder symptoms, and [that] children who exhibit these traits are destined to become adult 'psychopaths'" (Kolko & Pardini, 2010, p. 722).

In our view, high-risk juveniles-including those with psychopathic features—are characterized mainly by an increased magnitude or severity of risk factors relative to other young offenders; that is, they differ from other young offenders more in degree than in kind. Given this conceptualization, developmental processes and contextual risk factors emphasized in juvenile interventions can be considered relevant to this population. For example, peer groups are key sources of influence during adolescence, and weak ties to conventional peers, ties to delinquent peers, and gang membership are strong risk factors for offending (Hawkins et al., 1998). Adolescents are also more driven toward risk taking when in the presence of peers than when alone (see Steinberg, 2009). Juveniles with psychopathic features are not immune to such influences. Youth with pronounced psychopathic features are likely to be integrated into delinquent peer groups (Kimonis, Frick, & Barry, 2004), commit crimes in groups (Goldweber, Dmitrieva, Cauffman, Piquero, & Steinberg, 2011), obtain low scores on measures of resistance to peer influence (Thornton, 2012), and engage in antisocial behavior that is significantly predicted by peer delinguency (if modestly less so than those with low-moderate psychopathic features; Kerr, Van Zalk, & Stattin, 2012).<sup>1</sup>

The point is that juvenile offenders with psychopathic features are-first and foremost-juveniles. Adolescence is an extended period of enormous developmental change that can confer both risk and opportunity for maximizing the effects of intervention (Crone & Dahl, 2012) on high-risk offenders (Skeem et al., 2014). For this reason, in reviewing relevant treatment research below, we consider findings (when possible) by age group. We use the terms "childhood" to refer to ages younger than 10, "early adolescence" for ages 10-13 (which typically marks hormonal changes at the onset of puberty), and "mid-late adolescence" for ages 14-18 (Crone & Dahl, 2012). Also, because youth with psychopathic features vary in such features themselves, we use the term "psychopathy" to refer to global measures that include general disinhibition/externalizing symptoms (and that overlap with measures of general risk), and "callous–unemotional" as a referent for more specific measures.

### Synthesis of Rigorous Treatment Studies

High-quality research specific to the treatment of juvenile offenders with psychopathic features is not extensive. However, it is certainly more plentiful than research of this type with adults, and it includes a sufficient number of studies that meet basic methodological standards to permit interpretation. We focus our review on studies with (1) relatively large sample sizes (to ensure adequate power and stable results), (2) an experimental design or quasi-experimental design with a wellmatched control group (to ensure that treatment effects can be assessed), and (3) measures of outcome that include change in antisocial behavior and/or psychopathic traits (ideally, over a reasonable posttreatment follow-up period). We exclude the weakest studies, that is, uncontrolled studies of whether high scores on measures of psychopathy or callous-unemotional features predict posttreatment antisocial behavior or other "outcomes." Uncontrolled studies provide no information about treatment response because they fail to address the counterfactual question of how much antisocial behavior would have been observed for comparable individuals without treatment. We specifically emphasize the rarer and strongest studies-namely, those that test whether treatment affects trajectories of antisocial behavior over time (for an excellent example, see Hyde et al., 2013). Studies of this type are best positioned to evaluate whether callous-unemotional features-which are strongly associated with serious conduct problems that can themselves be "treatment resistant"-uniquely complicate the treatment process.

Methods and results for the six studies that best meet the previously mentioned criteria are summarized in Table 29.1. Three studies largely focus on mid–late adolescent offenders (Butler, Baruch, Hickey, & Fonagy, 2011; Caldwell, Skeem, Salekin, & Van Rybroek, 2006; Manders, Deković, Asscher, van der Laan, & Prins, 2013), two focus on clinic-referred children and early adolescents (Dadds, Cauchi, Wimalaweera, Hawes, & Brennan, 2012; Kolko et al., 2009), and one focuses on toddlers (Hyde et al., 2013). As might be expected (given the rigor of the designs), most of the studies (i.e., five of the six) focus on packaged treatment programs for conduct problems.

The main conclusion that can be drawn from these studies is that children and adolescents with callous-unemotional features respond to prevention or intensive treatment with reduced antisocial behavior. The study that best illustrates this conclusion is the only one that focuses on juveniles with marked psychopathic traits (mean PCL:YV > 30) and histories of violence. Caldwell, Skeem, and colleagues (2006) found that high-psychopathic mid-late adolescents who participated in an intensive custodial treatment program were 2.7 times less likely to reoffend violently during a 2-year period following release, compared with those who participated in custodial treatment as usual (TAU). Compared to TAU, the intensive treatment program involved more services (e.g., 45 programming weeks) and a philosophy more consistent with the RNR model. Specifically, there was less emphasis on sanctions and more emphasis on social skills acquisition, developing conventional social bonds to displace antisocial associations and activities, and eroding antagonistic relationships with authority figures to overcome defiant attitudes. Aggression Replacement Training (a group-based program that focuses on violence reduction) was also applied. The intensive program yielded a benefit-cost ratio of more than 7 to 1 over the TAU group (Caldwell, Vitacco, & Van Rybroek, 2006).

The studies summarized in Table 29.1 also raise one major question: Do callous–unemotional features moderate the effect of branded, "evidencebased" treatment programs for conduct problems on trajectories of antisocial behavior? As yet, the focus must be on programs for conduct disorder because there are no such treatment programs specifically for juvenile psychopathy. With respect to *prevention*, Hyde and colleagues (2013) provide compelling evidence that young children's callous–unemotional features do not moderate the positive effect of a brief program for conduct problems. But for *treatment* programs, results are mixed.

For example, multisystemic therapy (MST; Henggeler, Schoenwald, Borduin, Rowland, & Cunningham, 1998) is an intensive, family-based program explicitly designed to reduce the need for out-of-home placement for high-risk youth. It has multiple components that target a broad range of risk factors (individual, peer, family). MST seems particularly relevant for "psychopathic" youth with pronounced disinhibition (cf. Patrick, Fowles, & Krueger, 2009; Patrick et al., 2013) given that it improves a range of externalizing symptoms (e.g., substance abuse, emotional problems; see Henggler & Sheidow, 2012). In a meta-analysis, Curtis, Ronan, and Borduin (2004) found no significant difference in the effect of MST on outcomes for violent and chronic juvenile offenders (d = 0.44) versus lower-risk youth (d = 0.38). But how does it fare with "psychopathic" young people?

As shown in Table 29.1, two investigations have assessed juveniles' psychopathy while testing the effectiveness of MST compared to TAU in a resource-rich environment (i.e., the United Kingdom and The Netherlands). Butler and colleagues (2011) demonstrated that MST reduced parents' (but not adolescents') posttreatment ratings of psychopathy and rates of offending over an average 3-year period (see White, Frick, Lawing, & Bauer, 2013, for an uncontrolled but similar demonstration). These findings are consistent with the notion that intensive treatment designed for high-risk—but not necessarily psychopathic youth can reduce criminal behavior for those with psychopathy. In contrast, Manders and colleagues (2013) found that callous-unemotional traits and narcissism moderated the effect of MST on end-oftreatment externalizing symptoms (i.e., MST had no advantage over usual services for those with pronounced traits). This finding suggests that packaged programs for "vanilla" high-risk youth (i.e., those with multiple risk factors and/or severe conduct disorder, but not necessarily psychopathy) require modification to systematically be responsive to those with callous-unemotional features.

In keeping with the latter notion—that treatment must be tailored to maximize effectiveness-Dadds, Cauchi, and colleagues (2012; see Table 29.1) found that risk reduction for early adolescents with callous-unemotional features was improved when their socioemotional deficits were directly addressed (see also Hawes and Dadds, 2005). Specifically, in a randomized controlled trial that compared a typical parent training intervention with one that added an emotion-recognition component (including parent-child exercises on accurately perceiving/interpreting emotions), Dadds, Cauchi, and colleagues found that youth with callous-unemotional traits showed significantly greater improvement in conduct problems over a 6-month follow-up period in the emotion-recognition condition.

In summary, available evidence indicates that "psychopathic" juveniles are high-risk cases that should be targeted with prevention programs and with intensive, appropriate treatment. It is possible (and, in our view, probable) that treatment will be most effective when specifically targeting callous-

	יווי ווסומנועכוץ במושכי עיכוו-טטוונוט	ווכת וו כמרוווכוור סרממוכז ווכוכאמוור רר	o ouverine i ayonopauny	
Study	Sample	Design/outcome	Treatment condition	Outcome
Butler et al. (2011)	<i>Correctional:</i> 108 youthful offenders in the United Kingdom ( <i>M</i> = 15 years) <i>Measure:</i> APSD, parent and youth reports	Randomly assigned to MST or TAU delivered by youthful offending teams Outcome: change in number of offenses over 30 months (including 18 months posttreatment); pre-post treatment change in APSD scores	Correctional treatments MST is an evidence-based, multimodal family intervention (see text for details)	MST was more effective than TAU in reducing offending, and also significantly reduced posttreatment parent (not adolescent) ratings of psychopathic traits.
Caldwell, Skeem, et al. (2006)	Correctional: 141 psychopathic male juvenile offenders (M = 17 years) Measure: PCL:YV	Propensity-matched groups in intensive treatment versus TAU Outcome: Violent recidivism over 2+-year follow-up.	Correctional treatments Intensive included greater services, less sanction-based philosophy and ART	Youth treated intensively were 2.7 times less likely to violently reoffend than those in TAU
Manders et al. (2013)	Clinical/correctional: 256 adolescents with conduct problems referred by social services and the courts to clinics in the Netherlands (M = 16 years) Measure: ICU for CU traits; APSD for narcissism and impulsiveness, parent reports	Randomly assigned to MST or TAU Outcome: End of treatment ratings of externalizing problems (adolescent- and parent-report); no follow-up period	Correctional treatments MST	CU traits did not predict posttreatment externalizing. However, CU and narcissistic traits moderated the effect of MST on end-of-treatment externalizing symptoms (MST had no advantage over TAU for those with pronounced traits).

# TABLE 29.1. Relatively Large. Well-Controlled Treatment Studies Relevant to Juvenile Psychopathy

s showed provement the emotion han in TAU.	ment ic-based attment cantly eatures (CU, lizing) and nd behavior. I not predict problems or	did not ffect of FCU ict problems 25 children is traits, who for growth in	n training; FCU, Checklist: Youth
Juveniles with CU trait significantly greater im in conduct problems in recognition condition t	Community-based treat was not superior to clin treatment. However, tre in both contexts signifu- reduced psychopathic fa narcissism, and externa improved functioning a Moreover, CU traits dic posttreatment conduct delinquency.	Deceitful-callous traits moderate the positive er on trajectories of condu (even in the subset of 1 high in deceitful-callou were particularly at risk conduct problems).	py; ERT, emotion recognitio erapy; PCL:YV, Psychopathy
Parenting interventions ERT included parent-child exercises on accurately perceiving/interpreting emotions	Parenting interventions Research clinicians provided modular therapy with the same content in <i>either</i> the community or clinic. Treatment content was tailored to families (and included parent management training, child CBT, medication, etc.)	Prevention program FCU generally involves three sessions; uses motivational interviewing to increase parents' awareness of problem behavior; focuses on increasing parents skills in addressing problems; program is "personalized"—tailored to individual families	unemotional; CBT, cognitive-behavioral thera ychopathology/icu.html); MST, multisystemic th
Randomly assigned to emotion recognition intervention or TAU Outcome: improvement in conduct problems over 6-month follow-up	Randomly assigned to community- versus clinic- based intensive modular treatment for conduct problems <i>Outcome:</i> change in externalizing and psychopathic traits (slope) over 3-year follow-up	Randomly assigned to no prevention or Family Check-Up (FCU; Dishion et al., 2008), a program initially validated for preventing antisocial behavior among adolescents and adapted here for young children Outcome: growth in conduct problems (slope), ages 2–4	ocial Process Screening Device; CU, callous– Traits (see http://labs.uno.edu/developmental-ps
Clinical: 191 clinic-referred juveniles with conduct problems (M = 11 years) Measure: modified ASPD; multiple informants; top 50% = "high CU"	<i>Clinical:</i> 177 children with conduct problems ( <i>M</i> = 9 years) <i>Measure:</i> APSD, teacher report; many additional measures of conduct problems	Community: 731 ethnically diverse young children at risk for conduct problems (M = 2.4 years) Measure: Deceitful–Callous scale derived from existing scales to approximate the CU scale of the APSD (assessed at age 3); caregiver report	aggression replacement training; APSD, Anti k-Up; ICU, Inventory of Callous-Unemotional J, treatment as usual.
Dadds, Cauchi, et al. (2012)	Kolko et al. (2009); Rolko & Pardini (2010)	Hyde er al. (2013)	<i>Note.</i> ART, Family Chec Version; TA

unemotional features. In fact, some scholars (e.g., Hyde et al., 2013; Kolko et al., 2009) have speculated that the mixed results for the branded programs described earlier are attributable to differences in the extent to which treatment protocols are personalized to address youths' specific risk factors and needs (implicitly including callous–unemotional features): Approaches that are modular and flexible may be more effective for juveniles with callous–unemotional features than interventions that are fixed and focused on general factors such as disinhibition.

### **Future Directions**

### Juveniles

### Mechanisms

As suggested by the previously noted absence of specialized treatment programs, a rarely realized justification for assessing juvenile psychopathy is to identify high-risk youth who need targeted treatment. The problem of service access, however, may not be limited to those with psychopathy. Even in Arizona, a rehabilitation-oriented state, almost half (43%) of 57 juvenile programs failed differentially to focus service provision on youth classified as high-risk (Redpath & Brander, 2010; see also Lipsey et al., 2010): that is, those who, according to the risk principle described earlier in the section on adults, are most likely to benefit from intensive services.

Given how rarely such services are applied, expanding the number of branded packages for highrisk youth-or creating packages specific for psychopathic youth-seems unlikely to reduce crime on a large scale (National Research Council, 2013). Instead, more may be gained by further articulating general principles about how and when to intervene as a response to criminal conduct, in order to activate specific mechanisms of change. Current models (e.g., RNR) have defined general principles of how to intervene (e.g., with structured, well-implemented, high-dosage treatment that targets risk factors), and with whom (highrisk youth). But little is known about what specific mechanisms of change to target and when to intervene to maximize impact (see Kazdin, 2007).

Callous–unemotional features appear to be particularly relevant targets for risk reduction efforts, but few systematic efforts have focused on how they can be changed (see Salekin, Tippey, & Allen, 2012, for a remarkable exception). Some elements of traditional cognitive-behavioral therapy (CBT) are theoretically relevant, such as those designed to increase perspective taking (i.e., increase empathy and guilt), and to effect behavior change through reliance on rewards rather than punishment (given punishment insensitivity; see Hawes & Dadds, 2005; Matthys, Vanderschuren, Schutter, & Lochman, 2012). But treatment innovation efforts may also benefit from findings of recent neuroscience-informed research. For example, Dadds and colleagues (2006) demonstrated that observed deficits in recognition of fearful facial expressions were reversed for children with callous-unemotional traits when they were told to "pay attention to the eyes." This finding suggests that recognition of others' distress can potentially be remedied using a basic behavioral manipulation. Similarly, Han, Alders, Greening, Neufeld, and Mitchell (2012) found that individuals with high callous-unemotional traits demonstrated less amygdala and medial prefrontal cortex activity than those lower in such traits when the eyes in facial pictures of fear were covered, but not when the eyes were isolated. The implication is that attention may be a malleable "empathy arousal mechanism" that can be altered to increase prosocial behavior. As such mechanisms become better understood, they can be embedded in principles for effective treatment that can be personalized to high-risk youth.

### Timing

Is there a developmental window of maximum opportunity for behavior change with high-risk youth? Although it is commonly presumed that "the earliest possible intervention is best," this assumption rests on the unsupported notion that children with severe conduct problems are a qualitatively distinct group that will continue offending into adulthood (see Skeem et al., 2014). The central question of when the greatest gains can be made with the subset of children exhibiting early-onset conduct problems that persist into adolescence (Odgers et al., 2007) remains to be addressed: Surprisingly few studies have examined whether (early) adolescence is an opportunity for maximal behavior change among offenders, and those that exist have done so with little precision. For example, in his meta-analysis of studies of youth between ages of 12 and 21, Lipsey (2009) found that the average age of juveniles did not significantly moderate the effect of treatment on recidivism. Age, however, is a poor marker of developmental maturity. Moreover, treatment programs vary in the extent to which they target social–affective processes that are often impaired among high-risk youth, and have been shown to be uniquely responsive to learning during adolescence (see Skeem et al., 2014).

Future research should directly evaluate whether intervening during (early) adolescence maximizes behavior change for the small subgroup of highrisk children whose early conduct disorder does not abate at puberty. As summarized by Crone and Dahl (2012), recent neurobehavioral research indicates that the onset of puberty marks the beginning of dramatic changes in reward processing, processing of emotional stimuli, and social-cognitive reasoning. Biological changes during this period sensitize youth to their social world and create tendencies to explore and engage. Although these tendencies confer vulnerability to risk-taking behavior (including crime), they also appear to offer adaptive advantages-in particular, increased capacity for social and affective learning relative to adults, including learning about trust, empathy, and more automatic patterns of behavioral response to specific emotional and social cues. Thus, for psychopathic youth, the transition to adolescence could provide a natural inflection point for promoting prosocial motivation and goals (rather than deepening already-antisocial ones). If so, policy could be shaped toward intervening during this period to yield large-scale effects on crime reduction.

### **Adults**

Our review of the literature on treatment with adult offenders leads us to conclude that findings from the body of relevant well-controlled studies are encouraging but not yet compelling; there is an urgent need for replication and systematic extension of existing work if the fragile momentum in this important domain is to be maintained. A factor that may account substantially for the current imbalance in treatment development and research in favor of young people is the common assumption that youth interventions are likely to have greater impact than those with adults. However, Lösel (2010) has suggested that this assumption is not necessarily true, arguing that interventions for high-risk (including psychopathic) individuals are likely to be of value at any age.

Compared to the issues that remain unresolved in the literature on treatment of juveniles, the questions that need to be addressed in regard to treating adults with psychopathy are even more elemental. There is simply a serious dearth of wellcontrolled outcome studies that address the following questions:

- 1. Can individuals with psychopathy benefit to the same degree as other offenders from traditional treatment programs for high-risk offenders?
- 2. Do particular features of psychopathy moderate treatment effects—and if so, which ones?
- 3. Do treatments designed to reduce antisocial behavior in offenders—which do not overtly target symptoms such as shallowness, grandiosity, or callousness—have an effect on core psychopathic traits?

To address these questions, systematic treatment– outcome studies that assess psychopathic tendencies and match treated and comparison groups on "Factor 1" features of psychopathy, as well as criminal risk, need to be undertaken.

Some key challenges confront efforts to conduct research on processes relevant to treatmentrelated change in high-risk adult offenders. One is simply the question of how best to measure changes over the course of treatment. Although callous-unemotional traits have been repeatedly assessed in treatment studies of juveniles, only variable risk factors for recidivism have been measured in studies of their adult counterparts. In no small part, this is because few psychopathy measures are designed to be sensitive to change, and research on change using measures of this type is scant to nonexistent. As such, there is a critical need for research on change as indexed by reliable, valid, and clinically feasible methods for ongoing monitoring of treatment progress, including measures of change in core psychopathic traits. Ideally, assessments of change would include observer report-based measures (e.g., therapist-, or researcherrated), as well as offender self-report indices.

Once more studies exist that address these fundamental questions, additional systematic investigations will be needed to advance understanding of mechanisms of change. The adult literature on mechanisms of change with offenders in general is sparse—more specifically, there is a need for investigations into *which* variable risk factors among those routinely assessed in clinical practice actually function as causal influences on psychopathic tendencies and propensity for offending (for discussion, see Kroner & Yessine, 2013; Mann et al., 2010; Monahan & Skeem, 2014). Future research on treatment design, process, and outcome should also investigate whether change processes are equivalent for variants of psychopathy. A particularly intriguing question in this regard pertains to the role that anxiety plays in recidivism for those with secondary psychopathy, and how this role should be addressed in treatment interventions.

Of further note, there is an older body of published studies-not reviewed here-on the treatment of psychopathy in adults. Harkening back to a time when individuals with psychopathy were treated using mainly unstructured psychotherapies, with little expectation of effectiveness, most of these studies were uncontrolled and otherwise methodologically inadequate; therefore, little can be concluded from them (Salekin, 2002). However, a notable feature of these studies that is lacking in the existing adult literature, but evident in contemporary youth studies, is their focus on outcomes other than criminal recidivism. Broadening the range of measured outcomes in future treatment research with adults would be particularly helpful for addressing crucial questions:

- Does treatment just reduce criminal behavior, or does it actually lead to broader reductions in socially and personally harmful behavior? Does it improve other desistance outcomes and
- increase prosocial behavior (e.g., participation in employment, more responsible parenting, decreased alcohol and drug use)?
- Does it set up conditions that may help with community reintegration?

Answering these questions would also indirectly inform understanding of change mechanisms.

Beyond these suggestions, what is the relevance of the new triarchic model of psychopathy (Patrick, Preface and Chapter 1, this volume; Patrick et al., 2009) for treatment? We know of no treatment research yet based on this model. However, Patrick, Drislane, and Strickland (2012) have provided interesting suggestions for neurobiologically informed intervention strategies (e.g., attentional retraining; cf. Baskin-Sommers et al., 2015) for addressing features of psychopathy, which we hope will stimulate investigation.

It may turn out that more evolved intervention programs for adults and younger individuals with psychopathy do not show incremental effectiveness over existing approaches to reducing impulsive–antisocial behavior (e.g., high-risk offender treatments). But treating psychopathy itself may be important for other reasons, including the potential of effective treatment to (1) restore faith among members of the public that psychopathic individuals are not intractable threats who must be indefinitely detained, and (2) assist the criminal and juvenile justice systems to meet their obligation to provide access to rehabilitation for all adjudicated individuals in need of it. As a whole, the state of current knowledge reviewed here encourages optimism regarding our ability to effect positive change in individuals with psychopathy justifying ongoing scholarly investment in systematic research that investigates the malleability of core psychopathic traits and harmful behaviors that emanate from them.

### NOTE

 Similarly, "sensation seeking"—the tendency to seek novel, intense, and exciting feelings and experiences—is pronounced among psychopathic youth and reaches peak levels during midadolescence (Steinberg, 2009). In a longitudinal study of 7,675 adolescents, Harden, Quinn, and Tucker-Drob (2012) found that (1) youth with high initial levels of sensation seeking manifested fewer increases in sensation seeking during adolescence than those with lower initial levels, but (2) within each youth, increases in sensation seeking significantly predicted increases in antisocial behavior.

### REFERENCES

- Alterman, A., Rutherford, M., Cacciola, J., McKay, J., & Boardman, C. (1998). Prediction of 7 months methadone maintenance response by four measures of antisociality. Drug and Alcohol Dependence, 49, 217–223.
- Andrews, D. A., & Bonta, J. (2010). Rehabilitating criminal justice policy and practice. *Psychology*, *Public Policy*, and Law, 16, 39–55.
- Andrews, D. A., Bonta, J., & Hoge, R. D. (1990). Classification for effective rehabilitation: Rediscovering psychology. Criminal Justice and Behavior, 17, 19–52.
- Baskin-Sommers, A. R., Curtin, J. J., & Newman, J. P. (2015). Altering the cognitive–affective dysfunctions of psychopathic and externalizing offender subtypes with cognitive remediation. *Clinical Psychological Sci*ence, 3, 45–57.
- Bernstein, D. P., Nijman, H. L. I., Karos, K., Keulen-de Vos, M., de Vogel, V., & Lucker, T. P. (2012). Schema therapy for forensic patients with personality disorders: Design and preliminary findings of a multicenter randomized clinical trial in the Netherlands. *International Journal of Forensic Mental Health*, 11, 312–324.

- Blackburn, R. (1999). Personality assessment in violent offenders: The development of the antisocial personality questionnaire. *Psychologica Belgica*, 39, 87–111.
- Bonta, J., & Andrews, D. A. (2016). The psychology of criminal conduct (6th ed.). London: Routledge.
- Butler, S., Baruch, G., Hickey, N., & Fonagy, P. (2011). A randomized controlled trial of multisystemic therapy and a statutory therapeutic intervention for young offenders. *Journal of the American Academy of Child and Adolescent Psychiatry*, 50, 1220–1235.
- Caldwell, M. F., McCormick, D. J., Umstead, D., & van Rybroek, G. J. (2007). Evidence of treatment progress and therapeutic outcomes among adolescent offenders with psychopathy features. Criminal Justice and Behavior, 34, 573–587.
- Caldwell, M. F., McCormick, D. J., Wolfe, J., & Umstead, D. (2012). Treatment-related changes in psychopathy features and behavior in adolescent offenders. Criminal Justice and Behavior, 39, 144–155.
- Caldwell, M., Skeem, J., Salekin, R., & Van Rybroek, G. (2006). Treatment response of adolescent offenders with psychopathy features: A 2-year follow-up. Criminal Justice and Behavior, 33(5), 571–596.
- Caldwell, M. F., Vitacco, M., & Van Rybroek, G. J. (2006). Are violent delinquents worth treating?: A cost–benefit analysis. *Journal of Research in Crime and Delinquency*, 43(2), 148–168.
- Cale, E. M. (2006). A quantitative review of the relations between the "Big 3" higher order personality dimensions and antisocial behavior. *Journal of Research in Personality*, 40, 250–284.
- Caspi, A., Roberts, B. W., & Shiner, R. L. (2005). Personality development: Stability and change. Annual Review of Psychology, 56, 453–484.
- Chakhssi, F., de Ruiter, C., & Bernstein, D. (2010). Change during forensic treatment in psychopathic vs. nonpsychopathic offenders. *Journal of Forensic Psychiatry and Psychology*, 21, 660–682.
- Clarkin, J. F., Levy, K. N., Lenzenweger, M. F., & Kernberg, O. F. (2007). Evaluating three treatments for borderline personality disorder: A multiwave study. *American Journal of Psychiatry*, 164, 922–928.
- Cleckley, H. (1976). The mask of sanity (5th ed.). St. Louis, MO: Mosby.
- Cooke, D. J., Hart, S. D., Logan, C., & Michie, C. (2012). Explicating the construct of psychopathy: Development and validation of a conceptual model, the Comprehensive Assessment of Psychopathic Personality (CAPP). International Journal of Forensic Mental Health, 11, 242–252.
- Crone, E. A., & Dahl, R. E. (2012). Understanding adolescence as a period of social–affective engagement and goal flexibility. *Nature Reviews Neuroscience*, 13(9), 636–650.
- Curtis, N. M., Ronan, K. R., & Borduin, C. M. (2004). Multisystemic treatment: A meta-analysis of outcome studies. Journal of Family Psychology, 18(3), 411–419.
- Dadds, M. R., Allen, J. L., Oliver, B. R., Faulkner, N., Legge, K., Moul, C., et al. (2012). Love, eye con-

tact and the developmental origins of empathy v. psychopathy. British Journal of Psychiatry, 200(3), 191–196.

- Dadds, M. R., Cauchi, A. J., Wimalaweera, S., Hawes, D. J., & Brennan, J. (2012). Outcomes, moderators, and mediators of empathic–emotion recognition training for complex conduct problems in childhood. *Psychiatry Research*, 199(3), 201–207.
- Dadds, M. R., Perry, Y., Hawes, D. J., Merz, S., Riddell, A. C., Haines, D. J., et al. (2006). Attention to the eyes and fear-recognition deficits in child psychopathy. *British Journal of Psychiatry*, 189(3), 280–281.
- Daly, T. E., & Polaschek, D. L. L. (2013, September). The effects of psychopathy on treatment behaviour and treatment outcomes in high-risk violent psychopaths. Paper presented at the Department of Corrections Psychologists' National Training Event, Rotorua, New Zealand.
- Dishion, T. J., Shaw, D. S., Connell, A. M., Gardner, F., Weaver, C. M., & Wilson, M. N. (2008). The Family Check-Up with high-risk indigent families: Preventing problem behavior by increasing parents' positive behavior support in early childhood. *Child Development*, 79, 1395–1414.
- Doren, D. (1987). Understanding and treating the psychopath. New York: Wiley.
- Edens, J. F., Campbell, J. S., & Weir, J. M. (2007). Youth psychopathy and criminal recidivism: A meta-analysis of the psychopathy checklist measures. *Law and Human Behavior*, 31(1), 53–75.
- Edens, J. F., Marcus, D. K., & Vaughn, M. G. (2011). Exploring the taxometric status of psychopathy among youthful offenders: Is there a juvenile psychopath taxon? Law and Human Behavior, 35, 13–24.
- Farber, B. A. (1989). Psychological mindedness: Can there be too much of a good thing? *Psychotherapy*, 26, 210–217.
- Forth, A. E., Kosson, D. S., & Hare, R. D. (2003). The Hare Psychopathy Checklist: Youth Version. Toronto: Multi-Health Systems.
- Frick, P., & Hare, R. D. (2001). The Antisocial Processes Screening Device. Toronto: Multi-Health Systems.
- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014). Can callous–unemotional traits enhance the understanding, diagnosis, and treatment of serious conduct problems in children and adolescents?: A comprehensive review. *Psychological Bulletin*, 140, 1–57.
- Galietta, M., & Rosenfeld, B. (2012). Adapting Dialectical Behavior Therapy (DBT) for the treatment of psychopathy. International Journal of Forensic Mental Health, 11, 325–335.
- Golden, C. J., Jackson, M. L., Peterson-Rohne, A., & Gontkovsky, S. T. (1996). Neuropsychological correlates of violence and aggression: A review of the clinical literature. Aggression and Violent Behavior, 1, 3–25.
- Goldweber, A., Dmitrieva, J., Cauffman, E., Piquero, A. R., & Steinberg, L. (2011). The development of

criminal style in adolescence and young adulthood: Separating the lemmings from the loners. *Journal of Youth and Adolescence*, 40(3), 332–346.

- Han, T., Alders, G. L., Greening, S. G., Neufeld, R. W., & Mitchell, D. G. (2012). Do fearful eyes activate empathy-related brain regions in individuals with callous traits? *Social Cognitive and Affective Neuroscience*, 7(8), 958–968.
- Harden, K. P., Quinn, P. D., & Tucker-Drob, E. M. (2012). Genetically influenced changes in sensation seeking drive the rise of delinquent behavior in adolescence. *Developmental Science*, 15, 150–163.
- Harris, G. T., & Rice, M. E. (2006). Treatment of psychopathy: A review of empirical findings. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 555–572). New York: Guilford Press.
- Harris, G. T., Rice, M. E., & Cormier, C. (1994). Psychopaths: Is a therapeutic community therapeutic? Therapeutic Communities: International Journal for Therapeutic and Supportive Organizations, 15, 283–299.
- Hawes, D. J., & Dadds, M. R. (2005). The treatment of conduct problems in children with callous–unemotional traits. *Journal of Consulting and Clinical Psychology*, 73(4), 737–741.
- Hawkins, J. D., Herrenkohl, T., Farrington, D. P., Brewer, D., Catalano, R. F., & Harachi, T. W. (1998). A review of predictors of youth violence. In R. Loeber & D. P. Farrington (Eds.), Serious and violent juvenile offenders: Risk factors and successful interventions (pp. 106–146). Thousand Oaks, CA: SAGE.
- Henggeler, S. W., Schoenwald, S. K., Borduin, C. M., Rowland, M. D., & Cunningham, P. B. (1998). Multisystemic treatment of antisocial behavior in children and adolescents. New York: Guilford Press.
- Henggeler, S. W., & Sheidow, A. J. (2012). Empirically supported family-based treatments for conduct disorder and delinquency in adolescents. *Journal of Marital and Family Therapy*, 38(1), 30–58.
- Hildebrand, M., de Ruiter, C., & de Vogel, V. (2004). Psychopathy and sexual deviance in treatead rapists: Association with sexual and nonsexual recidivism. Sexual Abuse: A Journal of Research and Treatment, 16, 1–24.
- Hilterman, E. B., Nicholls, T. L., & van Nieuwenhuizen, C. (2013). Predictive validity of risk assessments in juvenile offenders: Comparing the SAVRY, PCL:YV, and YLS/CMI with unstructured clinical assessments. Assessment, 20, 1–16.
- Hobson, J., Shine, J., & Roberts, R. (2000). How do psychopaths behave in a prison therapeutic community? *Psychology*, *Crime and Law*, 6, 139–154.
- Hollin, C. (2008). Evaluating offending behaviour programmes: Does only randomization glitter? Criminology and Criminal Justice, 8, 89–106.
- Hyde, L. W., Shaw, D. S., Gardner, F., Cheong, J., Dishion, T. J., & Wilson, M. (2013). Dimensions of callousness in early childhood: Links to problem behavior and family intervention effectiveness. *Development and Psychopathology*, 25(2), 347–363.

- Karpman, B. (1941). On the need of separating psychopathy into two distinct clinical types: The symptomatic and the idiopathic. *Journal of Criminal Psychopathology*, 3, 112–137.
- Kazdin, A. E. (2007). Mediators and mechanisms of change in psychotherapy research. Annual Review of Clinical Psychology, 3, 1–27.
- Kennealy, P. J., Skeem, J. L., Walters, G. D., & Camp, J. (2010). Do core interpersonal and affective traits of PCL-R psychopathy interact with antisocial behavior and disinhibition to predict violence? *Psychological Assessment*, 22, 569–580.
- Kerr, M., Van Zalk, M., & Stattin, H. (2012). Psychopathic traits moderate peer influence on adolescent delinquency. *Journal of Child Psychology and Psychiatry*, 53(8), 826–835.
- Kimonis, E. R., Frick, P. J., & Barry, C. T. (2004). Callous-unemotional traits and delinquent peer affiliation. *Journal of Consulting and Clinical Psychology*, 72(6), 956–966.
- Kimonis, E. R., Skeem, J. L., Cauffman, E., & Dmitrieva, J. (2011). Are secondary variants of juvenile psychopathy more reactively violent and less psychosocially mature than primary variants? *Law and Human Behavior*, 35, 381–391.
- Kirkpatrick, J. T., Draycott, S., Freestone, M., Cooper, S., Twiselton, K., Watson, N., et al. (2010). A descriptive evaluation of patients and prisoners assessed for dangerous and severe personality disorder. *Journal of Forensic Psychiatry and Psychology*, 21, 264–282.
- Kolko, D. J., Dorn, L. D., Bukstein, O. G., Pardini, D., Holden, E. A., & Hart, J. (2009). Community vs. clinic-based modular treatment of children with early-onset ODD or CD: A clinical trial with 3-year follow-up. *Journal of Abnormal Child Psychology*, 37(5), 591–609.
- Kolko, D. J., & Pardini, D. A. (2010). ODD dimensions, ADHD, and callous–unemotional traits as predictors of treatment response in children with disruptive behavior disorders. *Journal of Abnormal Psychology*, 119, 713–725.
- Kroner, D. G., & Yessine, A. K. (2013). Changing risk factors that impact recidivism: In search of mechanisms of change. *Law and Human Behavior*, 37, 321– 336.
- Krueger, R. F., Schmutte, P. S., Caspi, A., Moffitt, T. E., Campbell, K., & Silva, P. A. (1994). Personality traits are linked to crime among men and women: Evidence from a birth cohort. *Journal of Abnormal Psychology*, 103, 328–338.
- Langton, C. M., Barbaree, H. E., Harkins, L., & Peacock, E. J. (2006). Sex offenders' response to treatment and its association with recidivism as a function of psychopathy. Sexual Abuse: A Journal of Research and Treatment, 18, 99–120.
- Lewis, K., Olver, M. E., & Wong, S. C. P. (2013). The Violence Risk Scale: Predictive validity and linking treatment changes with recidivism in a sample of high risk and personality disordered offenders. Assessment, 20, 150–164.

- Lipsey, M. W. (2009). The primary factors that characterize effective interventions with juvenile offenders: A meta-analytic overview. *Victims and Offenders*, 4(2), 124–147.
- Lipsey, M. W., Howell, J. C., & Kelly, M. R. (2010). Improving the effectiveness of juvenile justice programs. Washington, DC: Center for Juvenile Justice Reform at Georgetown University.
- Lipsey, M. W., Wilson, D. B., & Cothern, L. (2000). Effective intervention for serious juvenile offenders. Washington, DC: U.S. Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention.
- Looman, J., Abracen, J., Serin, R. C., & Marquis, P. (2005). Psychopathy, treatment change and recidivism in high risk high need sexual offenders. *Journal* of Interpersonal Violence, 20, 549–568.
- Lösel, F. (2010, October). What works in reducing reoffending: A global perspective. Paper presented at the 12th annual conference of the International Corrections and Prisons Association, Gent, Belgium.
- Lowenkamp, C., & Latessa, E. (2004). Increasing the effectiveness of correctional programming through the risk principle: Identifying offenders for residential placement. Criminology and Public Policy, 4, 501–528.
- Manders, W. A., Deković, M., Asscher, J. J., van der Laan, P. H., & Prins, P. J. (2013). Psychopathy as predictor and moderator of multisystemic therapy outcomes among adolescents treated for antisocial behavior. Journal of Abnormal Child Psychology, 41(7), 1121–1132.
- Mann, R. E., Hanson, R. K., & Thornton, D. (2010). Assessing risk for sexual recidivism: Some proposals on the nature of psychologically meaningful risk factors. Sexual Abuse: A Journal of Research and Treatment, 22, 191–217.
- Matthys, W., Vanderschuren, L. J. M. J., Schutter, D. J. L. G., & Lochman, J. E. (2012). Impaired neurocognitive functions affect social learning processes in oppositional defiant disorder and conduct disorder: Implications for interventions. Clinical Child and Family Psychology Review, 15, 234–246.
- McCrae, R. R., & Costa, P. T. (1994). The stability of personality: Observations and evaluations. Current Directions in Psychological Science, 3, 173–175.
- Millon, T. (1997). MCMI-III manual (2nd ed.). Minneapolis, MN: National Computer Systems.
- Moffitt, T. E. (2003). Life-course-persistent and adolescence-limited antisocial behavior: A 10-year research review and a research agenda. In B. B. Lahey, T. E. Moffitt, & A. Caspi (Eds.), Causes of conduct disorder and juvenile delinquency (pp. 49–75). New York: Guilford Press.
- Moffitt, T. E., Lynam, D. R., & Silva, P. A. (1994). Neuropsychological tests predicting persistent male delinquency. *Criminology*, 32, 277–300.
- Monahan, J., & Skeem, J. L. (2014). Risk redux: The resurgence of risk assessment in criminal sanctioning. *Federal Sentencing Reporter*, 26, 158–166.

- National Research Council. (2013). Reforming juvenile justice: A developmental approach. Washington, DC: National Academies Press.
- Newhill, C. E., Vaughn, M. G., & DeLisi, M. J. (2010). Psychopathy scores reveal heterogeneity among patients with borderline personality disorder. *Journal of Forensic Psychiatry and Psychology*, 21, 202–220.
- Odgers, C. L., Milne, B. J., Caspi, A., Crump, R., Poulton, R., & Moffitt, T. E. (2007). Predicting prognosis for the conduct-problem boy: Can family history help? Journal of the American Academy of Child and Adolescent Psychiatry, 46, 1240–1249.
- Ogloff, J. R. P., Wong, S. C. P., & Greenwood, A. (1990). Treating criminal psychopaths in a therapeutic community program. *Behavioral Sciences and the Law*, 8, 181–190.
- Olver, M. E., Stockdale, K. C., & Wong, S. C. (2012). Short- and long-term prediction of recidivism using the youth level of service/case management inventory in a sample of serious young offenders. *Law and Human Behavior*, 36, 331–344.
- Olver, M. E., & Wong, S. C. P. (2009). Therapeutic responses to psychopathic sexual offenders: Treatment attrition, therapeutic change, and long-term recidivism. Journal of Consulting and Clinical Psychology, 77, 328–336.
- Olver, M., & Wong, S. C. P. (2013). A description and research review of the Clearwater Sex Offender Treatment Programme. Psychology, Crime and Law, 19, 477–492.
- Olver, M. E., Wong, S. C. P., Nicholaichuk, T., & Gordon, A. (2007). The validity and reliability of the Violence Risk Scale—Sexual Offender Version: Assessing sex offender risk and evaluating therapeutic change. *Psychological Assessment*, 19, 318–329.
- Onken, L. (2015). Cognitive training: Targeting cognitive processes in the development of behavioral interventions. *Clinical Psychological Science*, 3, 39– 44.
- Patrick, C. J., & Drislane, L. E. (2015). Triarchic model of psychopathy: Origins, operationalizations, and observed linkages with personality and general psychopathology. *Journal of Personality*, 83, 627–643.
- Patrick, C. J., Drislane, L. E., & Strickland, C. (2012). Conceptualizing psychopathy in triarchic terms: Implications for treatment. International Journal of Forensic Mental Health, 11, 253–266.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. Development and Psychopathology, 21, 913–938.
- Patrick, C. J., Hicks, B. M., Krueger, R. F., & Lang, A. R. (2005). Relations between psychopathy facets and externalizing in a criminal offender sample. *Journal* of Personality Disorders, 19, 339–356.
- Patrick, C. J., Venables, N. C., Yancey, J. R., Hicks, B. M., Nelson, L. D., & Kramer, M. D. (2013). A construct-network approach to bridging diagnostic and physiological domains: Application to assessment of

externalizing psychopathology. Journal of Abnormal Psychology, 122, 902–916.

- Polaschek, D. L. L. (2008). Rimutaka Violence Prevention Unit Evaluation Report V: Interim/progress report on prospective evaluation. Unpublished report for the New Zealand Department of Corrections, Wellington, New Zealand.
- Polaschek, D. L. L. (2010). Treatment non-completion in high-risk violent offenders: Looking beyond criminal risk and criminogenic needs. *Psychology*, *Crime* and Law, 16, 525–540.
- Polaschek, D. L. L. (2011). High-intensity rehabilitation for violent offenders in New Zealand: Reconviction outcomes for high- and medium-risk prisoners. *Journal of Interpersonal Violence*, 26, 664–682.
- Polaschek, D. L. L. (2015). Adult criminals with psychopathy: Common beliefs about treatability and change have little empirical support. Current Directions in Psychological Science, 23, 296–301.
- Polaschek, D. L. L., & Kilgour, T. G. (2013). New Zealand's Special Treatment Units: The development and implementation of intensive treatment for highrisk male prisoners. *Psychology, Crime and Law, 11*, 511–526.
- Poythress, N. G., Edens, J. F., Skeem, J. L., Lilienfeld, S. O., Douglas, K. S., Frick, P. J., et al. (2010). Identifying subtypes among offenders with antisocial personality disorder: A cluster-analytic study. *Journal of Abnormal Psychology*, 119, 389–400.
- Redpath, D. P., & Brander, J. K. (2010). The Arizona Standardized Program Evaluation Protocol (SPEP) for assessing the effectiveness of programs for juvenile probationers. Phoenix: Arizona Supreme Court, Administrative Office of the Courts, Juvenile Justice Service Division.
- Rice, M. E., Harris, G. T., & Cormier, C. A. (1992). An evaluation of a maximum security therapeutic community for psychopaths and other mentally disordered offenders. *Law and Human Behavior*, 16, 399–412.
- Richards, H. J., Casey, J. O., & Lucente, S. W. (2003). Psychopathy and treatment response in incarcerated female substance abusers. *Criminal Justice and Behavior*, 30, 251–276.
- Roberts, B. W., & Mroczek, D. (2008). Personality trait change in adulthood. Current Directions in Psychological Science, 17, 31–35.
- Ross, R. R., Fabiano, E. A., & Ewles, C. D. (1988). Reasoning and rehabilitation. International Journal of Offender Therapy and Comparative Criminology, 32, 29–36.
- Salekin, R. T. (2002). Psychopathy and therapeutic pessimism: Clinical lore or clinical reality? *Clinical Psychology Review*, 22, 79–112.
- Salekin, R. T., Tippey, J. G., & Allen, A. D. (2012). Treatment of conduct problem youth with interpersonal callous traits using mental models: Measurement of risk and change. *Behavioral Sciences and the Law*, 30(4), 470–486.

- Salekin, R. T., Worley, C., & Grimes, R. D. (2010). Treatment of psychopathy: A review and brief introduction to the mental model approach for psychopathy. *Behavioral Sciences and the Law*, 28, 235–266.
- Saradjian, J., Murphy, N., & McVey, D. (2013). Delivering effective therapeutic interventions for men with severe personality disorder within a high secure prison. Psychology, Crime and Law, 11, 433–477.
- Seivewright, H., Tyrer, P., & Johnson, T. (2002). Change in personality status in neurotic disorders. *Lancet*, 359, 2253–2254.
- Seto, M. C., & Barbaree, H. E. (1999). Psychopathy, treatment behavior, and sex offender recidivism. Journal of Interpersonal Violence, 14, 1235–1248.
- Singh, J. P., Grann, M., & Fazel, S. (2011). A comparative study of violence risk assessment tools: A systematic review and metaregression analysis of 68 studies involving 25,980 participants. *Clinical Psychology Review*, 31, 499–513.
- Sissons, M. K. A., & Polaschek, D. L. L. (2017). Exploring personality and psychopathology profiles, criminal risk and recidivism in high risk, psychopathic prisoners. Manuscript under revision.
- Skeem, J. L., Johansson, P., Andershed, H., Kerr, M., & Louden, J. E. (2007). Two subtypes of psychopathic violent offenders that parallel primary and secondary variants. *Journal of Abnormal Psychology*, 116, 395–409.
- Skeem, J. L., Manchak, S. M., Lidz, C. W., & Mulvey, E. P. (2012). The utility of patients' self-perceptions of violence risk: Consider asking the person who may know best. *Psychiatric Services*, 64(5), 410–415.
- Skeem, J. L., Monahan, J., & Mulvey, E. (2002). Psychopathy, treatment involvement, and subsequent violence among civil psychiatric patients. *Law and Human Behavior*, 26, 577–603.
- Skeem, J. L., Polaschek, D. L. L., & Manchak, S. (2009). Appropriate treatment works, but how?: Rehabilitating general, psychopathic, and high risk offenders. In J. L. Skeem, K. Douglas, & S. Lilienfeld (Eds.), Psychological science in the courtroom: Controversies and consensus (pp. 358–384). Washington, DC: American Psychological Association.
- Skeem, J. L., Polaschek, D. L. L., Patrick, C. J., & Lilienfeld, S. O. (2011). Psychopathic personality: Bridging the gap between scientific evidence and public policy. Psychological Science in the Public Interest, 12, 95–162.
- Skeem, J. L., Scott, E., & Mulvey, E. P. (2014). Justice policy reform for high-risk juveniles: Using science to achieve large-scale crime reduction. *Annual Review* of Clinical Psychology, 10, 709–739.
- Steinberg, L. (2009). Should the science of adolescent brain development inform public policy? American Psychologist, 64(8), 739–750.
- Stockdale, K. C., Olver, M. E., & Wong, S. C. P. (2010). The Psychopathy Checklist: Youth Version and adolescent and adult recidivism: Considerations with respect to gender, ethnicity, and age. *Psychological Assessment*, 22, 768–781.

- Taft, C. T., Murphy, C. M., Musser, P. H., & Remington, N. A. (2004). Personality, interpersonal, and motivational predictors of the working alliance in group cognitive-behavioral therapy for partner violent men. Journal of Consulting and Clinical Psychology, 72, 349–354.
- Tew, J., & Atkinson, R. (2013). The Chromis Programme: From conception to evaluation. *Psychology*, *Crime and Law*, 11, 415–431.
- Thornton, L. (2012). Adolescents with callous–unemotional traits and their roles in group crime. Unpublished doctoral dissertation, University of New Orleans, New Orleans, LA.
- Ward, T., Polaschek, D. L. L., & Beech, A. R. (2006). Theories of sexual offending. Chichester, UK: Wiley.
- White, S. F., Frick, P. J., Lawing, K., & Bauer, D. (2013). Callous–unemotional traits and response to functional family therapy in adolescent offenders. *Behavioral Sciences and the Law*, 31, 271–285.
- Wilson, N. J., Kilgour, T. G., & Polaschek, D. L. L. (2013). Treating high risk rapists in a New Zealand intensive prison programme. *Psychology, Crime and Law*, 11, 527–547.
- Wong, S. C. P. (2000). Psychopathic offenders. In S. Hodgins & R. Muller-Isberner (Eds.), Violence, crime and mentally disordered offenders (pp. 87–112). Chichester, UK: Wiley.
- Wong, S. C. P. (2013). Treatment of psychopathy in correctional settings. In O. Thienhaus & M. Piasecki

(Eds.), *Textbook on correctional psychiatry* (pp. 6-1–6-26). New York: Civic Research Press.

- Wong, S. C. P., & Gordon, A. (2006). The validity and reliability of the Violence Risk Scale: A treatmentfriendly violence risk assessment tool. *Psychology*, *Public Policy*, and Law, 12, 279–309.
- Wong, S. C. P., Gordon, A., Gu, D., Lewis, K., & Olver, M. E. (2012). The effectiveness of violence reduction treatment for psychopathic offenders: Empirical evidence and a treatment model. *International Journal of Forensic Mental Health*, 11, 336–349.
- Wong, S. C. P., & Hare, R. D. (2005). Guidelines for a psychopathy treatment program. Toronto: Multi-Health Systems.
- Wong, S., Olver, M. E., Nicholaichuk, T. P., & Gordon, A. E. (2003). The Violence Risk Scale—Sexual Offender version (VRS–SO). Saskatoon, SK, Canada: Regional Psychiatric Centre, Department of Psychology and Research.
- Wormith, J. S., & Olver, M. E. (2002). Offender treatment attrition and its relationship with risk, responsivity, and recidivism. *Criminal Justice and Behavior*, 29, 447–471.
- Yang, M., Wong, S. C. P., & Coid, J. W. (2010). The efficacy of violence prediction: A meta-analytic comparison of nine risk assessment tools. *Psychological Bulletin*, 136, 740–767.
- Young, J. E., Klosko, J., & Weishaar, M. (2003). Schema therapy: A practitioner's guide. New York: Guilford Press.

# CHAPTER 30

# Legal and Ethical Issues in the Assessment and Treatment of Psychopathy

## JOHN F. EDENS JOHN PETRILA SHANNON E. KELLEY

II Psychopathy" is a term that is increasingly found in both judicial opinions and legislation, and that appears as a focus of expert testimony in numerous types of criminal and civil cases (DeMatteo et al., 2014a, 2014b; Edens & Cox, 2012; Viljoen, McLachlan, & Vincent, 2010). Although the legal system has a history of using the term uncritically, "psychopathy" lies at the heart of some of the most contentious debates in criminal and mental health law. Those debates address fundamental legal questions such as the restraint of liberty and imposition of the death penalty, as well as professional issues, such as the proper role of mental health expertise, diagnoses, and labels in legal proceedings.

When the first edition of this chapter was published (Edens & Petrila, 2006), the mental health field had been experiencing since the early 1990s an explosion of research on psychopathy, largely prompted by (1) the publication of the Psychopathy Checklist—Revised (PCL-R; Hare, 1991, 2003) and the development of several self-report scales designed to assess psychopathic traits, and (2) general dissatisfaction with the conceptualization of antisocial personality disorder in the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV; American Psychiatric Association [APA], 2000). At that time, however, with a few notable exceptions (see Edens, Petrila, & Buffington-Vollum, 2001; Hare, 1996, 1998; Hart, 1998; Lyon & Ogloff, 2000; Ogloff & Lyon, 1998; Zinger & Forth, 1998), there had been limited scholarly discussion or empirical analysis of the role of psychopathy specifically within the legal system, or of ethical issues related to the growing use of psychopathy scales to influence case outcomes. The original version of this chapter focused on legal contexts in which psychopathy was being introduced, and on professional and ethical issues that can arise when assessing psychopathy for purposes of addressing legal questions. In this update, we revisit several key topics that were raised in the original chapter and review a wealth of new evidence that has been published since the first edition of this handbook. This new evidence examines how psychopathy is impacting the legal field and directly bears on the ethical use of assessment instruments developed to measure this personality disorder.

In the first section of this chapter ("The Role of Psychopathy in the Legal System"), we provide a brief overview of the legal contexts in which the term "psychopath" has been used. We discuss in the second section ("Assessing Psychopathy: Ethical Standards and Guidelines") the specific role of the mental health examiner in assessing psychopathy, focusing on ethical issues related to the assessment itself, controversies regarding what types of conclusions and inferences should be made regarding the results of these assessments, and how to communicate these conclusions and inferences to nonclinicians in the legal system who may be unfamiliar with this construct and its implications.

In terms of new research included in this updated chapter, there now have been several case law surveys examining the role of psychopathy measures in legal proceedings, as well as a considerable amount of research published on the applied or "field" reliability of psychopathy measures in real-world criminal and civil cases (as opposed to PCL-R assessments performed for research purposes). Additionally, numerous simulation studies have now investigated how evidence concerning psychopathic traits may influence non-mental health professionals' attitudes concerning "psychopaths" and their adjudication in the criminal and juvenile justice and forensic mental health systems. In the sections that follow, we summarize these lines of research and discuss their implications concerning the role of psychopathy in the legal system.

### The Role of Psychopathy in the Legal System

### The Legal Contexts in Which "Psychopathy" Is Used

The use of the term "psychopath" in legal settings has a long history. In the past, the term was used liberally in civil commitment and mental health statutes. Today the term, or something that effectively becomes an analogue, is likely to be used in statutes that are designed to further the longterm confinement of certain classes of individuals. These uses include preventive detention, sex offender civil commitment hearings, and waiver hearings to determine whether a juvenile should be tried in adult court. For example, the sexual offender statutes found today in the United States permit the indefinite confinement of individuals, often at the end of a prison sentence; the individual cannot be released absent a showing that he or she will not be dangerous in the future. Such legislation generally assumes a *lack* of treatability. For example, the state of Washington statute asserts that "in contrast to persons appropriate for civil commitment . . . sexually violent predators

generally have antisocial personality features which are unamenable to existing mental illness treatment modalities. . . . The prognosis for curing sexually violent predators is poor . . ." (Wash. Laws Sec. 71-09-010 [2000]). In Texas, an assessment to determine whether an individual suffers from a "behavioral abnormality" that makes him or her more likely to engage in predatory sexual violence must include "testing for psychopathy, a clinical interview, and other appropriate assessments and techniques" (Tex. Health & Safety Code Sec. 841.023 [2004]). In Europe, psychopathy is increasingly utilized to assess for potential difficulties in institutional adjustment (e.g., aggressive behaviors) among forensic inpatients and prison inmates (Levgraf & Elsner, 2007). In Canada, evidence of psychopathy frequently is introduced to support a "Dangerous Offender" designation, which imposes indeterminate detention on offenders presumed to constitute a threat to other persons by reason of violent or sexual tendencies. Canadian legislation also provides for the lesser designation of "Long-Term Offender" to classify dangerous individuals who are deemed amenable to reintegration contingent on extended periods of community management following determinate sentences (for review of these sanctions, see Blais & Forth, 2014b; Lloyd, Clark, & Forth, 2010). In the United States, prosecutors have used "psychopathy" to support a finding that a defendant will be dangerous in the future, an aggravating factor that informs capital punishment verdicts in several jurisdictions (Cunningham & Reidy, 2002; Edens & Cox, 2012; Edens, Petrila, & Buffington-Vollum, 2001). Psychopathy has also been considered in U.S. cases concerned with civil commitment, noncapital sentencing, and, increasingly, parole decisions (DeMatteo et al., 2014b), particularly in California, where assessment for the disorder is a required component of release hearings for life sentenced inmates with parole eligibility (Guy, Kusaj, Packer, & Douglas, 2015). Occasionally, evidence of psychopathy has been introduced in regards to termination of parental rights, competency to stand trial, and determinations of criminal responsibility (DeMatteo et al., 2014b; Walsh & Walsh, 2006).

Some statutory provisions explicitly use the term "psychopathy," whereas others invite application of the construct in determining which individuals qualify for long-term confinement, including preventive detention in the case of Canadian "Dangerous Offender" hearings. Although the term "psychopathy" is becoming pervasive, there are still differences in how it is used in particular settings, an issue with ramifications for clinicians, policymakers, and legal decision makers.

### Issues of Language and "Fit"

The term "psychopath," when used in a statute, typically does not mean the same thing as the term "psychopath" as used throughout this handbook. For example, "sexual psychopath" statutes in the United States tend to emphasize a requirement that an individual lack control over his or her behavior; this is because of concerns that failing to emphasize volition would invite the courts to rule that such statutes were unconstitutional (Janus, 1998; see also Kansas v. Crane, 2002). A lack of control-at least in regard to how the legal concept of volitional impairment typically is construed in relation to criminal cases—is not a defining characteristic of psychopathy as it is commonly conceptualized by clinicians, although there are anecdotal examples of such claims being made in court. For example, in one case, In the Interest of J.M. (2006), an expert witness gave testimony asserting that the defendant's elevated PCL-R Factor 1 score was indicative of "impoverished volitional control," as it is legally defined. Discussing research on psychopathy, the expert remarked that there exists "clear unequivocal laboratory evidence of a deficit in response modulation . . . the best operational [sic] you are going to get of diminishment of volitional capacity" and accordingly characterized psychopathy as "a personality disorder that makes [the defendant] likely to engage" in future sexual offending (pp. 522–523, see also Burdick v. Wolff, 2011; State v. Anderson, 2007). Such testimony has the potential to be quite influential: Aspinwall, Brown, and Tabery (2012) reported that judges reviewing a hypothetical case who were exposed to evidence of psychopathy along with a biological explanation for its development reported increased concerns about amenability to treatment and future dangerousness-although they also perceived it as less aggravating, recommended shorter sentences, and mentioned an increased number of mitigating factors in rationales for their determinations. As such, this type of evidence might best be characterized as a "double-edged sword" at this time. Despite its potential influence on judges or jurors, testimony concerning neurological or psychophysiological correlates of psychopathy is of limited relevance to legal decisions (e.g., sentencing, culpability), as currently available research of this type suffers from numerous methodological

limitations and has not been shown to add any incremental utility to standard assessment methods in predicting or explaining criminal behavior (Hare, Black, & Walsh, 2013; Patrick, Venables, & Skeem, 2012).

In addition, terms such as "antisocial personality disorder," "psychopathy," "sociopathy," and "dissocial personality disorder" are often used interchangeably, despite the differing criteria for each label (Ogloff & Lyon, 1998). The use of these alternative labels has important ramifications for mental health professionals performing assessments in legal settings. For example, examiners have been known to equate antisocial personality disorder and psychopathy even though the base rates of the former in the legal system are much higher than the base rates of the latter (as defined by the typical cutoff of 30 and above on the PCL-R). Additionally, the same term may carry different meanings for mental health professionals, attorneys, judges, jurors, and legislators (Furnham, Daoud, & Swami, 2009; Hoff, Rypdal, Mykletun, & Cooke, 2012; Smith, Edens, Clark, & Rulseh, 2014). As such, forensic examiners should carefully define the terms they use when working in the legal arena. Additionally, their assessment results should not be presented as operationalizing the legal definition of what constitutes "a psychopath" or a "dangerous offender" more generally. In relation to legal decision making, it has been argued (Otto & Heilbrun, 2002) that the PCL-R is best construed as a "forensically relevant instrument" (FRI); that is, although not specifically psycholegal in nature, it measures a construct that may be pertinent to consider in relation to various legal questions, such as whether a sex offender is at increased risk to engage in further predatory sexual crimes if released back into the community. Being relevant to a legal issue should not, however, be equated with a legal standard.

### **General Questions of Legal Admissibility**

In the United States, questions regarding the admissibility of expert testimony historically were governed by the Frye rule (*Frye v. United States*, 1923), according to which scientific evidence was deemed admissible if it had gained "general acceptance" in the scientific community of interest. In the federal courts, this test was superseded by the decision of the U.S. Supreme Court in *Daubert v. Merrell-Dow Pharmaceuticals, Inc.* (1993). The Court ruled that the Federal Rules of Evidence, particularly Rule 702, govern the decision of a trial court regarding the acceptance of scientific evidence. The trial court was to consider a variety of factors in its decision, including whether the testimony's underlying reasoning or methodology is scientifically valid and properly can be applied to the facts at issue in the case. The Court suggested that trial judges should consider a number of factors in making this decision, including the testability of the theory or technique in question, whether peer review has been applied, the known or potential error rate, presence and use of standards controlling its operation, and whether the theory or technique had attracted widespread acceptance within a relevant scientific community. In Canada, the courts examine four factors in determining whether to admit expert evidence: its relevance, whether the evidence is necessary to assist the trier of fact, the presence or absence of an exclusionary rule, and an expert who is qualified (Ogloff & Lyon, 1998).

In general, courts have accepted the use of actuarial risk assessment instruments, as well as the PCL-R, under any of these tests. Most of the cases in the United States have involved hearings under sexual offender statutes, with one court commenting that "our research has revealed no state appellate court decision which has found actuarial instruments inadmissible at SVP (sexual violent predator) proceedings" (In re Commitment of R.S., 2001, at 96; In re Detention of Holtz, 2002; Garcetti v. Superior Court, 2000, upholding the admissibility of the PCL-R among other instruments). In fact, challenges to the admissibility of the PCL-R and other information pertaining to risk appear to be relatively infrequent occurrences in most courts at this time. When they do occur, the most commonly observed argument against admissibility is that the PCL-R possesses little to no probative value, whereas claims that such evidence is unduly prejudicial are rarely put forth (DeMatteo et al., 2014b). Although admissibility challenges have typically been unsuccessful, particularly in Frye jurisdictions (Edens & Cox, 2012), a handful of rulings that resulted in the exclusion of PCL-R-based evidence are noteworthy (DeMatteo, Hodges, & Fairfax-Columbo, 2016). For example, one court held that the PCL-R is both irrelevant and prejudicial, agreeing with the defense that it should not have been introduced at trial (Stitt v. United States, 2005). More recently, PCL-R-related evidence was excluded by a federal judge specifically due to its limited probative value and potentially prejudicial influence in capital murder trials (United States v. Richardson, 2012).

We believe that courts should examine questions of admissibility more critically than they have in the past, particularly given extant findings that cast doubt on the reliability of PCL-R ratings in applied settings (see, e.g., discussions of reliability and validity in subsequent sections). Although accumulated research findings suggest that PCL-R scores correlate with various socially undesirable outcomes (e.g., criminal recidivism) and professional survey results indicate that the instrument has achieved general acceptance within a comparatively broad scientific community, it should not be assumed that a particular examiner's score for any given defendant/offender is necessarily "reliable and valid." Given this, more analytic precision by the courts in assessing the question of admissibility would be welcome and would sharpen the inquiry into not only the strengths but also the limitations of assessments of psychopathy.

### Assessing Psychopathy: Ethical Standards and Guidelines

The American Psychological Association's (2010) amended ethical guidelines and code of conduct provide general standards to which examiners should adhere when conducting any type of psychological evaluation (e.g., Ethical Standards 9.01-9.11), as well as general guidelines to which examiners should aspire when engaged in such work. In addition, the Specialty Guidelines for Forensic Psychologists (American Psychological Association, 2013) also should be given careful consideration by professionals engaged in forensic practice. As a general comment, although one might assume that many of the issues addressed below are not particularly likely to be "troublespots" for most examiners, it is surprising to see how often they become a point of contention in legal cases. Moreover, there is ample and growing evidence (e.g., DeMatteo et al., 2014a, 2014b; Edens, 2006; Hare, 1998; Ogloff & Lyon, 1998; Zinger & Forth, 1998) to suggest that these issues are not given sufficient attention by at least some examiners working in the legal system.

In this section, we begin with an overview of reliability and validity issues concerning psychopathy when it is used in adversarial legal proceedings. Next, we specifically consider ethical issues related to (1) when assessments of psychopathy may and may not be justifiable to conduct; (2) what measures should be used to operationalize psychopathy when the construct is considered appropriate to
assess; (3) qualifications to use the PCL-R and its derivatives; and (4) information and data sources needed to score these measures adequately. We conclude with a discussion of specific concerns we have about how this information is used in various settings, and how it is presented by examiners to nonclinicians, who may know little or nothing about this complex construct.

#### How Reliable Are Psychopathy Assessments in Legal Contexts?

In the first edition of this handbook, we lamented the fact that the legal field seemed to give little or no consideration to the reliability estimates of the PCL-R and its standard error of measurement. We argued that confidence intervals surrounding reported scores were a more defensible method of reporting results than discrete scores, as they represent the likely range in which an individual defendant or offender's "true" score actually falls and also make clearer some of the intrinsic limitations of psychological assessment data. More recent case law surveys (DeMatteo et al., 2014a; Edens, Cox, Smith, DeMatteo, & Sörman, 2015) suggest that examiners are increasingly describing reliability issues when providing testimony about the PCL-R. In particular, it is not uncommon to see cases in which examiners report (typically in layperson language) that two examiners should provide PCL-R scores that are within  $\pm 3$  points of each other, presumably based on the standard error of measurement (SEM) reported in the instrument's professional manual.

We also suggested in the first edition of this chapter that reliability estimates reported in the PCL manuals and published research almost certainly should be considered "best case" scenarios, in that they typically have been derived from controlled studies in nonadversarial circumstances, using examiners with extensive training. This may be a far cry from some "real-world" contexts involving less optimal data, less well-trained examiners, or external pressures on both defendants and examiners that may impede the objective collection and interpretation of information relevant to psychopathy. Questions concerning the generalizability of published reliability statistics from research to applied settings began to surface following anecdotal observations (Edens, 2006; Edens & Vincent, 2008) of scoring discrepancies between expert witnesses that were well beyond (e.g., 15 points) what would be expected based on the measurement error estimates reported in the PCL-R manual: intraclass correlation coefficients (ICCs) of .86+ and SEM estimates of approximately 3 points for the PCL-R Total score (Hare, 2003).

More recently, both field studies and experimental manipulations of PCL-R scoring have investigated this lack of agreement in a more systematic manner and identified several areas of concern. For example, adversarial allegiance clearly impacts PCL-R scores in sex offender cases (DeMatteo et al., 2014a; Edens et al., 2015; Murrie, Boccaccini, Guarnera, & Rufino, 2013; Murrie, Boccaccini, Johnson, & Janke, 2008). Prosecution-retained experts in these studies have tended to provide significantly higher PCL-R scores relative to defenseretained experts, with average discrepancies as high as eight points in some studies (Murrie et al., 2008). In one experimental study (Murrie et al., 2013), 99 forensic mental health experts were led to believe they were working for either the defense or prosecution while reviewing four SVP cases. Although one case with a very low mean PCL-R score showed acceptable convergence across prosecution and defense consultants, the remaining three cases demonstrated marked allegiance effects, with Cohen's d for the difference between consultant groups ranging from 0.55 to 0.85. Moreover, although any two PCL-R ratings of the same defendant should only differ by more than 2 SEM's approximately 4% of the time, across these three cases differences this large were observed between 28 and 33% of the time. (In the fourth case, examiners differed by more than 2 SEM's in 13% of the comparisons.)

Even in contexts in which there is no strong reason to expect adversarial allegiance, forensic examiners in the field have not demonstrated interrater reliability statistics that are close to the values reported in the PCL-R manual (Edens, Boccaccini, & Johnson, 2010; Edens et al., 2015; Jeandarme et al., 2017; Miller, Kimonis, Otto, Kline, & Wasserman, 2012; Sturup et al., 2014; Tyrer et al., 2005; cf. Harris, Rice, & Cormier, 2013). Such poor reliability stems at least in part from mean differences in how high in psychopathy examiners seem to view the average examinee; that is, some forensic mental health professionals provide much higher scores on average than others (Boccaccini, Turner, & Murrie, 2008).

Another potential contributor to poor reliability is that interpersonal and affective features of psychopathy (e.g., grandiosity, callousness, remorselessness) may be especially susceptible to rater disagreement, due to the relative subjectivity of ratings in comparison with items based on more quantifiable behaviors (e.g., criminal versatility). Multiple field studies have reported single rater absolute agreement ICC values for PCL-R Factor 1 scores in the range of .50 or lower (Edens et al., 2010; Jeandarme et al., 2017; Miller et al., 2012; Rufino, Boccaccini, Hawes, & Murrie, 2012; see also Sturup et al., 2014; Tyrer et al., 2005), suggesting that at least half the variance in individual examiners' scores is attributable to some type of error.

Various commentators have argued that rating scales used in applied settings should have minimum interrater reliabilities of .80 (Heilbrun, 1992) or even .85 (Rosenthal & Rosnow, 1991). Recently, Harris and colleagues (2013) argued that the PCL-R can achieve acceptable reliability in clinical contexts when evaluations are conducted by publicly funded, experienced clinicians with no allegiance to either side of the case. They presented reliability data for 58 cases that compared PCL-R scores completed by a research assistant with scores provided by hospital clinicians, reporting an ICC of .79 for psychopathy total scores. However, the interrater reliability of Factor 1 items was questionable, with both Interpersonal and Affective facets exhibiting ICC values below .70. Additionally, the Harris and colleagues study was limited in that the clinician ratings were provided mainly by two specific mental health examiners (accounting for 42 of the 58 cases).

In the aggregate, the field study results reviewed earlier raise troubling concerns about the use of the PCL-R in legal cases and suggest that the interrater reliability and SEM estimates for the Total score reported in the manual (.86+ and 2.9, respectively) are not representative of the instrument's practical limitations in adversarial legal proceedings. In reviewing the extant literature, Edens and colleagues (2015) argued that in applied settings, the PCL-R Total score ICC for a single rater was mostly likely within the range of .50 to .60, with an SEM of approximately 5. If the SEM of the instrument when introduced into adversarial settings is actually in the range of 5 points, the 68% confidence interval surrounding an average PCL-R score for North American male prisoners (approximately 22; Hare, 2003, p. 55) would be between 17 and 27, or between the 28th and 71st percentiles (Hare, 2003, p. 164). Using a more conservative 95% confidence interval, raw score values would be between 12 and 32, or between the 13th and 91st percentiles.

Such a wide band of uncertainty would severely limit the validity of any inferences that could be drawn concerning these test scores. As an example of impaired predictive validity when field reliability estimates are poor, Murrie, Boccaccini, Caperton, and Rufino (2012) reported that PCL-R scores from SVP assessments in Texas (n = 333) were largely unrelated to sexual and violent recidivism. We address in the next section issues concerning test validity in greater detail, but it should be borne in mind that the findings to be reviewed are based on assessments conducted by trained researchers, which, as noted, may be appreciably more reliable than those completed by clinicians in applied (and particularly adversarial) settings.

#### How Valid Is Psychopathy for Purposes of Legal Decision Making?

It is common in legal case summaries to see the PCL measures globally described as reliable and "valid" by expert witnesses and judges. Although somewhat understandable, such encompassing assertions in the context of the legal system typically are off-point because they ignore what is usually a context-specific question about the utility of a measure as it relates to a particular legal question (DeMatteo & Edens, 2006; Foster & Cone, 1995). Such statements also run counter to professional guidelines, which state that reliability and validity are not static properties that reside within a test-and certainly not within professional rating scales completed by a diverse array of mental health examiners. "Validity" refers to the utility of inferences that can be drawn from specific test scores (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 2014). When psychopathy is used in relation to violence risk assessments, the question of its validity revolves around its predictive utility in relation to the criterion of interest. As such, discussions of the validity of the PCL should be framed in terms of the particular question(s) it is intended to inform (e.g., violence risk of a released sex offender). Blanket statements that overgeneralize about complex concepts such as validity for the sake of simplicity (e.g., "The PCL-R is valid") are ultimately not defensible. More exacting and appropriately constrained assertions about the meaning of psychopathy scores in relation to particular legal questions should be offered (e.g., "Assuming adequate levels of interrater reliability, PCL-R scores can meaningfully differentiate between those released offenders who are at higher versus lower risk for community violence"). Moreover, admissibility standards such as the Daubert criteria would argue for a careful examination of the validity of any assessment technique in relation to the case at hand.

Two areas in which the issue of validity comes clearly to the fore are violence risk and treatment amenability. Particularly in these areas, we believe the construct of psychopathy lends itself to considerable overreaching by the courts, perhaps with the implicit or explicit support of at least some forensic mental health examiners. In relation to risk assessment issues, a few key areas are worth highlighting beyond those noted earlier. First, although the use of standardized inventories represents an improvement over unaided clinical judgment, a diagnosis of psychopathy should not be equated with a designation of "dangerousness," nor should it foster any particular level of confidence regarding dichotomous predictions of violence for a specific offender. Although in many contexts a high score on the PCL-R identifies someone who is probabilistically more likely to engage in violence than someone with a lower score, this is not the functional equivalent of a "dangerous offender" or "sexual psychopath" classification. These are legal categories that may be informed by expert mental health testimony but are ultimately decided by the trier of fact. Moreover, separate from the legal issue is the empirical fact that the base rates of criminal recidivism for psychopathic offenders over relatively long follow-up periods are quite variable and sometimes relatively low (Freedman, 2001). Although this does not preclude the use of the PCL-R to inform risk assessments, it does raise complicated questions regarding the merits of categorical claims regarding an offender's degree of risk (e.g., "Offender X is at 'high risk' to reoffend"; for a review, see Heilbrun, Dvoskin, Hart, & McNiel, 1999).

More generally, one might question whether it is defensible to use the categorical label "psychopath" at all, particularly in adversarial legal settings. Zinger and Forth (1998), for example, support the use of dimensional measures rather than categorical terminology because it provides more precision in testimony and lessens the chance for judicial misunderstanding. A similar position has been advanced by the American Psychological Association (2010), which advises against the labeling of individuals by their disorder or disability (e.g., "schizophrenics," "paraplegics," and "psychopaths"). Perhaps following from these recommendations, clinicians conducting adult and/ or juvenile risk assessments most commonly refer to psychopathy-related characteristics in describing offenders rather than a definitive diagnosis, although adult risk assessment reports in particular frequently do state whether or not an offender is a "psychopath" (Viljoen, McLachlan, & Vincent, 2010).

One argument in favor of such a dichotomization would be that there is evidence that a latent taxon underlies psychopathy (Harris, Rice, & Quinsey, 1994) and that "psychopaths comprise a discrete natural class" (Harris, Skilling, & Rice, 2001, p. 197, emphasis added). However, contrary to this assertion, over the past decade research using more advanced taxometric procedures provides compelling evidence that both the composite construct of psychopathy and its distinguishable components are dimensional in nature, in both youth and adults (Edens, Marcus, Lilienfeld, & Poythress, 2006; Edens, Marcus, & Vaughn, 2011; Guay, Ruscio, Knight, & Hare, 2007; Murrie et al., 2007; Walters, Duncan, & Mitchell-Perez, 2007; Walters, Marcus, Edens, Knight, & Sanford, 2011). As such, qualitative references to whether an individual is "a psychopath," which appear relatively frequently in North American criminal cases (DeMatteo et al., 2014b; Viljoen, McLachlan, & Vincent, 2010), do not appear to be justified by the current state of the evidence.

This same concern arises in relation to the relevance of psychopathy to the question of treatment amenability, in that individuals designated as "psychopaths" are often viewed as a class of individuals who are untreatable. Despite such assertions, the degree to which psychopathy is in fact amenable to intervention remains an area of open inquiry and is subject to increasingly optimistic discussion and research, as evidenced by a recent special issue of the International Journal of Forensic Mental Health in concert with the Second Bergen Conference on the Treatment of Psychopathy (see also Polaschek & Skeem, Chapter 29, this volume). The nihilistic outlook of some commentators is being challenged by recent reviews and newer data that provide some evidence of treatment effects for both adult and adolescent offenders (Caldwell, McCormick, Wolfe, & Umstead, 2012; D'Silva, Duggan, & Mc-Carthy, 2004; Salekin, Worley, & Grimes, 2010; Skeem, Polaschek, & Manchek, 2009; Wong, Gordon, Gu, Lewis, & Olver, 2012). However, in comparison with other domains of psychopathy research, treatment strategies and outcomes have undergone disappointingly little advancement, with emerging evidence based largely on case studies or recently initiated programs with preliminary results. Several critical questions have yet to be addressed, including whether psychopathy itself responds to treatment and how variations in constellations of psychopathic traits may correspond to heterogeneity in treatment outcomes (Polaschek & Daly, 2013). One exception to this dearth of empirical research is the literature on treatment of psychopathic juvenile offenders, which indicates success in reducing the likelihood of future violence when appropriate intervention strategies are used (Caldwell, 2011; Caldwell et al., 2012; Caldwell, Skeem, Salekin, & Van Rybroek, 2006).

Nonetheless, available research to date does suggest that individuals high in psychopathic traits have been *less likely* to benefit from the types of interventions that have generally been investigated and tend to exhibit interfering behaviors such as impulsive-disruptive behavior, difficulty in forming emotional attachments, and limited motivation for change (Leygraf & Elsner, 2007). In our view, however, these findings do not support a conclusion that psychopathy is "untreatable." Similar to interpretations of findings from recidivism studies (Edens, Petrila, & Buffington-Vollum, 2001; Edens, Skeem, Cruise, & Cauffman, 2001), such results for treatment studies indicate a probabilistic difference in outcome rather than a categorical distinction between high and low PCL scorers in terms of treatability. As such, we believe that examiners should scrupulously avoid misinterpreting the results of extant studies to conclude that psychopathy is immutable.

Moreover, based on such nomothetic (grouplevel) findings, examiners frequently are asked to draw idiographic conclusions about particular individuals. Again, the legal determination that a fact finder must address may be informed by mental health evidence or testimony, and such testimony in turn should be informed by a critical understanding of the strengths and limitations of the extant treatment literature. The relative absence of controlled studies examining treatment approaches that are known to decrease recidivism among offender populations would seem to militate against drawing categorical conclusions that a particular psychopathic offender will not respond to correctional interventions that work with other offenders. Perhaps even more important is for forensic evaluators to be aware of the limitations of earlier treatment research, which in some instances involved interventions that were ethically questionable and unlikely to result in improvement (e.g., Harris, Rice, & Cormier, 1994; for details, see Polaschek & Skeem, Chapter 29, this volume). These premature conclusions based on methodologically weak studies (Vincent & Hart, 2012) are indeed disputed by numerous findings that offenders with high PCL-R scores can benefit from treatments intended to reduce risk for general or violent recidivism when interventions are appropriately administered and predominantly focused on dynamic risk factors (Polaschek & Daly, 2013).

#### In What Contexts Are Assessments of Psychopathy Justifiable?

Given the influential and potentially prejudicial connotations of the term "psychopath" (see below) and the nature of certain items comprising the PCL-R (e.g., lack of remorse, superficial charm), it is incumbent on the examiner to consider closely what types of contexts do and do not warrant the potential introduction of this term (see Standard 1.01: Misuse of Psychologists' Work; Standard 3.04: Avoiding Harm; American Psychological Association, 2010). Although space constraints preclude an exhaustive review of this subject (see Vincent & Hart, 2012, for one perspective on what constitute unsupportable legal opinions about psychopathy), we believe that examiners should consider as a primary issue whether an adequate empirical evidence base exists for bringing the construct of psychopathy to bear on the particular question being addressed-that is, in more formal legal terms, whether psychopathy has any demonstrated "probative" value in relation to the issue(s) to be addressed by the evaluation. As the American Psychological Association ethics code clearly dictates, "Psychologists administer, adapt, score, interpret, or use assessment techniques, interviews, tests, or instruments in a manner and for purposes that are appropriate in light of the research on or evidence of the usefulness and proper application of the techniques" (Standard 9.02(a); American Psychological Association, 2010, p. 12, emphasis added).

To the extent that examiners are willing to make inferential leaps regarding the application of psychopathy and related characteristics or diagnoses to a particular legal question where their relevance is questionable, they are treading on ethically questionable grounds in generalizing from their assessment data. For example, attention has recently been focused on the legal and ethical controversies in applying the concept of remorse (or remorselessness) to sentencing determinations. Qualitative analysis has identified considerable variability in how criminal judges define and weight remorse in judicial decision making, with most judges acknowledging a role for forensic mental health experts in addressing questions pertaining to remorse (Zhong et al., 2014). However, arguments have been made against including this ostensibly moral construct in forensic assessments, based in particular on the idea that psychological experts do not have specialized expertise in measuring remorse, and lack a reliable and valid instrument with which to accurately judge an individual's status in this regard (Morse, 2014).

Furthermore, the focus on remorse in these contexts is not currently defensible on consequential grounds (e.g., as a predictor of future dangerousness or recidivism that informs crime prevention efforts) given the lack of systematic data regarding the association between remorse and relevant outcomes. Despite the prevalent perception of remorse as a justifiable component of forensic evaluation, commentators such as Morse (2014) have argued that the current state of knowledge precludes a principled application of this concept to legal issues. Moreover, given the low item-level interrater reliability of the PCL-R remorselessness criterion in published field studies, it is difficult to argue that mental health professionals have any particular "expertise" in reliably assessing this concept relative to laypersons (e.g., jurors).

As a general guideline, we suggest that there are three broad domains in which psychopathy may be relevant to consider in legal settings: (1) risk assessment, (2) mental or behavioral "abnormality" issues, and (3) treatment amenability. Despite our identification of these broad areas of relevance, however, we do not mean to imply that psychopathy will be germane in all (or even most) specific contexts within these broader domains. For example, we have written extensively (Edens, 2001; Edens, Buffington-Vollum, Keilen, Roskamp, & Anthony, 2005; Edens, Colwell, Desforges, & Fernandez, 2005; Edens, Desforges, Fernandez, & Palac, 2004; Edens, Guy, & Fernandez, 2003; Edens, Petrila, & Buffington-Vollum, 2001; Guy, Edens, Anthony, & Douglas, 2005) about the limited probative value of psychopathy to inform questions of "future dangerousness" in death penalty cases in the United States. Despite the general association between psychopathy and aggression, the specific (and relatively rare) form of violence at issue in capital cases (i.e., violence committed while incarcerated in a U.S. prison) is not meaningfully informed by knowledge of whether a capital defendant is a PCL-R-defined psychopath (for a more detailed review, see Edens, Petrila, & Buffington-Vollum, 2001, Edens et al., 2005; for a slightly different perspective, see Hare, 2003, p. 15).

As another example, though the use of psychopathy to inform issues of "mental disease or defect" or "behavioral abnormality" may be considered justifiable in relation to the civil commitment of sexual predators, courts historically have taken a rather dim view of efforts to apply this construct to adjudicative competence and insanity issues. Insanity standards for the most part have been revised over the years to minimize the relevance of a lack of "volitional control" over one's behavior as a viable defense (see Melton, Petrila, Poythress, & Slobogin, 2007, for a more detailed review). Yet a very similar legal and psychological conception is quite prominent in sexual predator civil commitment laws (e.g., Kansas v. Crane, 2002; Kansas v. Hendricks, 1997). Nevertheless, examiners who attempt to introduce psychopathy or antisocial personality disorder evidence in criminal cases to support arguments that defendants are less capable of exercising volitional control over their actions are likely to be met with legal definitions that preclude such evidence and/or a judiciary that is generally unreceptive to such information (Lyon & Ogloff, 2000).

As another caveat, even if psychopathy has an empirically demonstrated association with a particular outcome of interest (e.g., community violence; Skeem & Mulvey, 2001), one should also consider whether there are equally (or more) useful assessment methods that are also less stigmatizing to the examinee in question. For example, closer examination of evidence pertaining to the PCL-R's relationship with violent behavior suggests that its social deviance and historic criminality component (Factor 2) demonstrates substantially more predictive utility relative to its interpersonal-affective (Factor 1) component (Kennealy, Skeem, Walters, & Camp, 2010; Yang, Wong, & Coid, 2010)—with the Antisocial facet of Factor 2 in particular exhibiting the greatest association with recidivism (Hawes, Boccaccini, & Murrie, 2013; Walters, Knight, Grann, & Dahle, 2008). These findings question the need to include in risk assessment aspects of the PCL-R that extend beyond nonspecific antisocial conduct. The interpersonal-affective features not only provide little to no incremental value but also may strongly contribute to undue prejudice in legal decisions concerning the examinee (see below). Notably, the third version of the Historical-Clinical-Risk Management-20 (HCR-20<sup>V3</sup>; Douglas, Hart, Webster, & Belfrage, 2013) no longer requires the inclusion of any of the Hare measures of psychopathy and the Violence Risk Appraisal Guide—Revised (VRAG-R; Rice, Harris, & Lang, 2013) has similarly dispensed with the need to incorporate PCL-R data, aside from scores on the Antisocial facet.

Finally, in relation to determinations of when or if psychopathy should be assessed, it is important to address the growing research base on "juvenile" psychopathy and the plethora of instruments ostensibly measuring these traits in children and adolescents (see Salekin, Andershed, & Clark, Chapter 20, this volume), including the Psychopathy Checklist: Youth Version (PCL:YV; Forth, Kosson, & Hare, 2003). Their widespread use in applied legal contexts is becoming increasingly common and consequential (Viljoen, MacDougall, Gagnon, & Douglas, 2010), with almost 80% of surveyed clinicians reporting use of psychopathy measures in at least one juvenile risk assessment (Viljoen, McLachlan, & Vincent, 2010). The matter of legal and ethical issues related to assessments of psychopathy in young people could fill an entire chapter itself, but we restrict our comments here to certain key issues that we believe are central to determining whether to use measures of these types in a given case.

First, claims regarding the long-term stability of psychopathy measures over the course of development have been met with mixed findings. Evidence from large-scale outcome studies of youth psychopathy suggest that these features exhibit some degree of stability across childhood and adolescence, and through the transition to adulthood (Burke, Loeber, & Lahey, 2007; Loney, Taylor, Butler, & Iacono, 2007; Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007; Lynam et al., 2009). For example, Burke and colleagues (2007) reported a stability coefficient of .66 for total scores on the PCL:YV from age 18 to age 19, which they characterized as "less than satisfactory" (p. 339). The stability of Factor 1 scores was particularly low (.43), with stability somewhat better for Factor 2 scores (.73). Over a much longer period of time, Lynam and colleagues (2009) reported a correlation of .31 between scores on the Childhood Psychopathy Scale (CPS) administered at age 12 and scores on the screening version of the PCL-R (PCL:SV; Hart, Cox, & Hare, 2005) at age 24 in a large sample of at-risk youth. Correlations for the CPS with the interpersonal and affective facets of the PCL:SV were only .19 and .15, respectively. Additional research (Cauffman & Skeem, 2004) suggests that more extreme PCL:YV scores can be expected to decrease significantly over time—a finding that has obvious implications for efforts to evaluate (e.g., in juvenile waiver evaluations) how amenable a particular child or adolescent might be to rehabilitation, or how likely the individual is to exhibit violent behavior in the future.

A second, related point concerns the predictive validity of the youth psychopathy construct. Although cumulative evidence to date suggests significant associations with general and violent outcomes (e.g., recidivism, institutional infractions), considerable heterogeneity has been identified among observed effects (Edens, Campbell, & Weir, 2007; see also Asscher et al., 2011), and there is some evidence that publication bias may factor into exaggerated claims regarding the strength of these associations (Edens & Campbell, 2007). In particular, juvenile psychopathy measures appear poorly suited for predicting sexual or long-term recidivism and general as well as violent offense outcomes among female and ethnically diverse offender samples (Edens & Cahill, 2007; Edens et al., 2007). Additionally, instruments designed for juvenile risk assessment (e.g., Youth Level of Service/Case Management Inventory; Hoge & Andrews, 2006) show comparable predictive validity and tend to outperform psychopathy-focused measures in samples of female and minority youth (Olver, Stockdale, & Wormith, 2009). Moreover, the youth psychopathy construct evinces little to no incremental validity beyond conduct disorder diagnoses or other relevant risk factors, such as substance use and property crimes, in the prediction of reoffending (Douglas, Epstein, & Poythress, 2008).

Finally, our concerns regarding the likely prejudicial impact of identifying adults as high in psychopathic traits (described in greater detail later) extend even more so to cases involving children and adolescents, where such traits are likely to promote more punitive responses, including harsher sentencing recommendations, support for the death penalty, and higher ratings of perceived dangerousness (Blais & Forth, 2014a; Boccaccini, Murrie, Clark, & Cornell, 2008; Edens et al., 2003; Vidal & Skeem, 2007). Importantly, juvenile risk assessments quite often focus on questions about prospects for rehabilitation (Viljoen, McLachlan, & Vincent, 2010), for which indications of psychopathy tend to foster perceptions of poor amenability to treatment (Viljoen, MacDougall, et al., 2010).

In summary, given the foregoing brief review of concerns surrounding the construct of "youth psychopathy," we believe examiners should be exceedingly cautious regarding what circumstances warrant the introduction of these instruments and labels. The recent addition of the "limited prosocial emotions" (LPE) specifier for conduct disorder in DSM-5 only heightens our concern in this regard given that the criteria included in this specifier closely align with the conception of juvenile psychopathy as categorical or discrete in nature (see the next section for an extended discussion of this specifier).

#### How Should Psychopathy Be Operationalized?

When the examiner has determined that it is justifiable to evaluate for psychopathy to inform an assessment question, or that it is required to be assessed by statute, the question then becomes one of how exactly to measure it. The long history of difficulty in assessing psychopathic traits reliably is well documented (see Part II, "Issues in Conceptualization and Assessment," this volume). Although rather critical reviews of the PCL-R have appeared in the literature recently (Edens, Magyar, & Cox, 2012; Edens et al., 2001; Gendreau, Goggin, & Smith, 2002; Yang et al., 2010), at the current state of knowledge it seems difficult to justify use of something other than the PCL-R once it has been determined that the construct of psychopathy per se is relevant (e.g., in Texas sexual predator evaluations, where "psychopathy" assessments are mandated by statute). Several promising alternative assessment procedures are in various stages of development and merit mention, although none seems sufficiently well validated at this point to warrant inclusion in forensic evaluations in which the assessment of psychopathy is meant to inform legal questions such as violence risk or treatment amenability.

The Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996), a self-report measure designed to capture personality traits relevant to the psychopathy construct, is the most extensively researched of new approaches, and its revised version (PPI-R; Lilienfeld & Widows, 2005) has been widely researched in both community and offender normative samples. However, additional models and corresponding assessment instruments have emerged as a means for addressing the perceived limitations of the PCL-R, such as its narrow focus on historical and criminal indicators of psychopathy (Vincent & Hart, 2012). Among these is the Comprehensive Assessment of Psychopathic Personality (CAPP; Cooke, Hart, Logan, & Michie, 2004; Cooke & Logan, Chapter 9, this volume), which broadly operationalizes psychopathy with respect to six domains, including characteristics related to dominance, attachment, and cognitive styles. In contrast to the static orientation of the PCL-R, the CAPP considers ostensibly dynamic components of psychopathy and can accordingly reflect change over time (e.g., due to interventions) with repeated assessment. Another conceptualization, the triarchic model of psychopathy (Patrick, Fowles, & Krueger, 2009), views psychopathy as encompassing tendencies of three distinct types, termed "meanness," "disinhibition," and "boldness." A key feature of this model is its delineation of the construct of boldness (entailing social dominance, emotional resiliency, and fearlessness) as an important component of psychopathy emphasized in historical writings but not well captured by the PCL-R. A specific measure for operationalizing this model exists in the form of the Triarchic Psychopathy Measure (TriPM; Drislane, Patrick, & Arsal, 2014), which contains subscales for indexing the three triarchic constructs.

The use of these alternative assessment approaches in applied settings at this time would appear to be ethically questionable at best given the current dearth of information needed to evaluate their utility in forensic contexts (e.g., normative data, professional manuals; see Heilbrun, 1992). That is not to imply, however, that some alternative scales may not be helpful for addressing particular issues where sufficient empirical justification exists for their use. For example, despite controversial views concerning the use of self-report measures in assessing psychopathy (Lilienfeld & Fowler, 2006; Sellbom, Lilienfeld, Fowler, & Mc-Crary, Chapter 10, this volume), content-relevant components of self-reports appear to demonstrate equivalent utility with traditional risk-appraisal procedures (e.g., the VRAG) in predicting recidivism and account for unique variance in criminal justice outcomes (Walters, 2006). For example, in a direct comparison, PPI total and factor scores outperformed PCL-R total and facet scores in predicting any form of institutional misconduct among prison inmates, with the two instruments demonstrating modest and negligible effect sizes, respectively, when evaluated in a joint prediction model (Edens, Poythress, Lilienfeld, & Patrick, 2008). In addition, although the Antisocial Features (ANT) scale of the Personality Assessment Inventory (PAI; Morey, 1991) does not correlate exceedingly well with the PCL-R (Douglas, Guy, Edens, Boer, & Hamilton, 2007; Edens, Hart, Johnson, Johnson, & Olver, 2000; Walters, Duncan, & Gever, 2003), empirical findings indicate that it correlates at least as well with indicators of institutional misconduct as the PCL-R, at least in U.S. samples of offenders in which the two measures have been compared directly (Buffington-Vollum, Edens, Johnson, & Johnson, 2002; Salekin, Rogers, & Sewell, 1997; Walters et al., 2003; for a recent meta-analysis, see Gardner, Boccaccini, Bitting, & Edens, 2015). As such, if examiners are charged with commenting on the likelihood of misconduct while an offender is institutionalized, then the ANT scale may in fact provide relevant information. Recent findings also suggest that high-risk individuals' self-perceptions of risk as assessed by clinical interview predict short-term community violence as sensitively as other brief measures of risk and add significant incremental utility to these instruments (Skeem, Manchak, Lidz, & Mulvey, 2013).

Further attention to the youth psychopathy construct has emerged with the introduction of the LPE specifier in DSM-5 (APA, 2013). This specifier intends to describe a distinct subgroup of youth with conduct disorder who exhibit features paralleling "callous and unemotional" psychopathic traits (Frick, Ray, Thornton, & Kahn, 2014), including lack of remorse or guilt, callousness or lack of empathy, lack of concern for performance, and shallow affect. Concerns about the utility of this classification in applied settings have been raised, however, with the assumption that the specifier will be reliably assessed by examiners resting on precarious grounds (Regier et al., 2013). In particular, the interpersonal and affective traits that correspond to key aspects of the LPE specifier (e.g., remorselessness) tend to be most problematic in terms of interrater reliability in adult assessments of psychopathy (e.g., Miller et al., 2012; Sturup et al., 2014). Additionally, claims that the specifier is likely to be no more stigmatizing than a diagnosis of conduct disorder (Frick & Moffitt, 2010; Frick & Nigg, 2012) have fallen under scrutiny. Empirical findings instead suggest that youthful offenders with conduct disorder who are ascribed features of the LPE specifier may be perceived as more evil, more dangerous, and more psychopathic than their counterparts who are not characterized by such traits (Edens, Mowle, Clark, & Magyar, 2017). The potential for prejudicial attitudes toward youth receiving the new specifier in conjunction with scant evidence of its probative value is a noteworthy issue, and warrants cautionary use of the term and its descriptors in applied settings.

#### Who Is Qualified to Assess Psychopathy via PCL Measures?

The question of what constitutes "adequate" training to administer, score, and interpret (as well as potentially testify about) the PCL-R is a complicated topic that goes beyond the issue of psychopathy itself and raises more general ethical issues related to forensic examiner competence and certification, as well as legal questions regarding credentialing as an expert witness (Melton et al., 2007). The ethics code of the American Psychological Association (2010) notes that competence is based on relevant education, training, supervised experience, consultation, study, or professional experience, but offers little in the way of specific recommendations as to what thresholds need to be achieved in these diverse areas.

The PCL-R manual (Hare, 2003) provides recommendations regarding qualifications for clinical use (e.g., possession of an advanced degree in the social, medical, or behavioral sciences and completion of graduate coursework in psychometrics and psychopathology; see pp. 16–17), although the author also notes that he has "no professional or legal authority to determine who can and cannot use the PCL-R, or to provide judgments about the adequacy of specific clinicians and their assessments" (p. 16). Despite this assertion, a review of Canadian cases suggests that the recommended qualifications listed in the PCL-R manual are given substantial weight when considering examiner competence. Similar to the recommendations in the PCL manuals, our position is that before assessing psychopathy in "real-world" contexts, an examiner should have knowledge of psychopathology and psychometric theory, possess some type of advanced degree in the social, medical, or behavioral sciences, have familiarity with both the relevant empirical literature and the population being assessed (e.g., sexual offenders, female offenders), and have training and experience in administering and scoring the PCL specifically (Forth et al., 2003; Hare, 2003). Although it may seem obvious that examiners should be competent to administer and score the PCL-R as well as interpret (see below) the results, there are ample anecdotal examples of use of the PCL measures by individuals who appear to be lacking in these basic qualifications (DeMatteo et al., 2014b; Edens, 2001; Hare, 1998).

Regarding the extensiveness of training itself, the PCL-R (Hare, 2003) and PCL:YV (Forth et al., 2003) manuals note that a formal series of basic and advanced workshops (with optional postworkshop evaluations of scoring accuracy) is provided by the Darkstone Research Group. Recently, Blais, Forth, and Hare (2017) examined the efficacy of these workshops in a sample of 280 individuals who completed six practice cases after completing the PCL-R training. Interrater reliability statistics for individual items were quite variable but relatively low overall. Reliability for facet scores was higher, although also quite variable (.51 to .83), with the total score producing an overall value of .75. The .51 reliability statistic for the affective deficit facet was particularly troubling, given the influence that perceived remorselessness appears to have on legal decision making.

The PCL manuals also note that the Darkstone workshops are *not* the exclusive means by which examiners may become competent to administer and score the PCL-R, and that some institutions have established their own in-house programs for training staff. It is also asserted that "most clinicians who participate in this [in-house] training should have little difficulty in conducting reliable PCL-R assessments" (Hare, 2003, p. 18), although we are aware of no published research specifically examining the efficacy of any particular training program.

In fact, satisfying the above training qualifications-at least to the extent to which the legal system will consider one as an "expert" examinermay still be insufficient to ensure reliable use of the PCL-R in applied contexts. Noted earlier, several researchers have found robust evidence of "examiner effects," or substantial variation in PCL-R scores among experienced experts retained by the same legal entity (e.g., Boccaccini, Murrie, et al., 2008; Boccaccini, Turner, & Murrie, 2008; Boccaccini, Turner, Murrie, & Rufino, 2012; Edens et al., 2015; Miller et al., 2012; Sturup et al., 2014). The influence of individual differences among examiners is strikingly evident in the finding from Boccaccini, Turner, and Murrie (2008) that 34% of variability in PCL-R scores was attributable specifically to the expert conducting the civil commitment evaluation, despite all examiners being retained by the state and presumably trained in objective assessment. Furthermore, in Canadian criminal cases, the observed variability in PCL-R scores deviates substantially from that expected by the manual statistics, with less than 50% of scores falling within one SEM and less than 75% within two SEM's (Edens et al., 2015). Evidence has also revealed that PCL-R scores generated by some examiners consistently outperform scores from others in predicting sexually violent recidivism (Murrie et al., 2012), suggesting that the extent to which validity estimates from research contexts generalize to forensic settings may be dependent on the administering examiner. However, explanatory factors (e.g., personality traits) for these observed discrepancies in average scores across examiners remain uncertain (Edens, Clark, Smith, Cox, & Kelley, 2013; Miller, Rufino, Boccaccini, Jackson, & Murrie, 2011).

#### What Type and How Much Information Is Required to Score PCL Measures?

The PCL-R manual (Hare, 2003) describes in detail the assessment procedures required to score it (pp. 18–22), with considerable attention given to item-level ratings (see Chapter 3 of the manual). Ideally, scoring is based on information derived from semistructured interviews, together with reviews of collateral data from institutional files and other sources. The manual specifies that PCL-R ratings should never be based on interview data alone, although scoring on the basis of collateral information alone is permitted. However, there is ample evidence that PCL-R scores based on collateral information alone are systematically lower than those based on interview plus collateral data (see, e.g., Hare, 2003, Table 4.7), perhaps due to the greater difficulty in extracting information regarding affective and interpersonal features without conducting an interview. However, ratings based solely on review of official records tend to exhibit greater agreement across differing evaluators compared to ratings that also incorporate interview information, suggesting that additional data derived from direct interaction with the examinee comes at the cost of greater variability in scores, possibly stemming from evaluators' use of different questions, hypotheses, and mannerisms (Rufino et al., 2012).

One rather large area of ambiguity related to the PCL assessments is exactly *how much* file and collateral data are needed when attempting to rate the individual items. Here again, American Psychological Association (2010) guidelines offer little in the way of specific instruction other than that psychologists should base their opinions on information and techniques sufficient to substantiate their findings (Standard 9.01(a): Bases for Assessments, p. 12). The PCL-R manual (Hare, 2003) notes (in boldface) that ratings "should not be made in the absence of adequate collateral information" (p. 19), but exactly what constitutes "adequate" information is left undefined. Although the manual describes several types of collateral information that would be useful to complete the PCL-R (e.g., arrest reports, institutional adjustment data, prior psychological evaluations, interviews with family members and friends), there is no "minimal threshold" that one can readily point to as a benchmark for declining to complete the PCL-R. It is certainly possible to omit specific items for which requisite scoring information is inadequate: The PCL-R manual recommends that as many as five items can be deleted, with subsequent proration of scores to account for this modification. Although helpful in dealing with lack of information for specific items, this recommendation does not really address the broader question, "How much is enough?" This would seem to be an even greater concern in relation to the PCL:YV, in that less collateral file information is likely to be available for informing the scoring of items with adolescents. The extent to which examiners agree or differ in how much information they consider necessary to reliably and validly rate the PCL measures is an important but unexamined topic of research.

#### Communicating about Psychopathy: Caveats and Qualifiers

At various points in this chapter, we have stressed the potentially "prejudicial" nature of psychopathy without reviewing real evidence to bolster such claims. As a background for considering some of our concerns about the introduction of PCL scores or other psychopathy-related diagnostic information into legal proceedings, we next review data consistent with our concerns that psychopathyrelated information has limited legal relevance, is potentially stigmatizing, and contributes to unduly pessimistic and punitive attitudes on the part of legal decision makers.

Among laypersons, the term "psychopath" brings to mind images of intelligent and socially dominant, but also depraved and dangerous individuals, including serial killers and mass murderers (Edens, Clark, et al., 2013; Furnham et al., 2009; Helfgott, 1997; Smith et al., 2014). For example, in a telephone survey of community residents, Helfgott (1997) reported that more than 60% of respondents identified Ted Bundy, Jeffery Dahmer, or Charles Manson when asked to name someone whom they believed to be a psychopath. Many respondents also equated psychopathy with pejorative terms such as "evil" (66%), "monster" (64%), and "morally bankrupt" (49%). Jury panel members have likewise identified notable serial killers as exemplars of psychopathy and, less commonly, political figures such as Hitler and Stalin (Edens, Clark, et al., 2013; Smith et al., 2014). In addition, participants' ratings of core features of psychopathy for a hypothetical capital murder defendant tend to reflect perceptions of "evilness" and a likelihood of committing future violence (Edens, Clark, et al., 2013), suggesting that the presence of psychopathic traits can have a pronounced impact on attitudes toward specific offenders, which in turn can influence legal dispositions.

In a series of studies manipulating the presence-absence of testimony related to psychopathy in death penalty and sexual predator cases (Edens et al., 2004, 2005; Guy & Edens, 2003, 2006), it has been demonstrated that psychopathic offenders in general are viewed more negatively and treated more severely by mock jurors than offenders identified as not mentally ill or as having a different type of disorder (e.g., schizophrenia, borderline personality disorder). Perhaps even more interesting, support for the death penalty in these studies has been relatively strongly associated with global perceptions of the defendant as exhibiting psychopathic traits—regardless of other testimony or case information reviewed. In particular, the greater the extent to which mock jurors construe the defendant to be exhibiting prototypical affective and interpersonal features of psychopathy, the higher the likelihood they will return a death verdict, especially when attributing remorselessness to the defendant (Cox, Clark, Edens, Smith, & Magyar, 2013; Edens, Davis, Fernandez Smith, & Guy, 2013). Real-world evidence supports a similar conclusion, in that surveys of actual jurors in capital murder cases have identified perceived traits such as remorselessness and egocentricity on the part of defendants as being influential in jurors' decisions to support a death verdict (Sundby, 1998). As such, unlike many psychological labels that may invoke sympathy (e.g., posttraumatic stress disorder, mental retardation) or at least indifference (e.g., generalized anxiety disorder, schizoid personality disorder), labeling someone a "psychopath" or as possessing psychopathic traits carries a negative connotation that may fundamentally alter how others view and respond to him or her (see also Douglas, Nikolova, Kelley, & Edens, 2015; Edens, Magyar, & Cox, 2013).

#### Summary

As noted earlier, the term "psychopath" is a powerful label that can have a profound impact on how individuals are perceived and treated within the legal system. In this chapter, we have identified several ethical issues that may arise when mental health examiners bring this complex psychological construct "out of the lab" and into the real world, and we have discussed the legal climate that surrounds psychopathy as it is construed by the criminal justice system. There are clearly instances in which the PCL-R and its derivatives in principle have "probative" value, in that scores from these instruments show meaningful associations with clinically important outcomes (e.g., violent recidivism). However, there is also growing evidence for misuse of these instruments in practice, including efforts to capitalize on its association with "bad" or "evil" individuals such as Charles Manson or Ted Bundy (Helfgott, 1997; Smith et al., 2014) to stigmatize criminal defendants (DeMatteo et al., 2014b; Edens et al., 2001). These concerns are compounded by the growing body of field reliability research raising serious questions as to how much of a given PCL-R score reflects attributes of the examinee versus sources of random and/or systematic error (e.g., adversarial allegiance) in legal cases.

In the previous edition of this handbook, we offered some general suggestions and comments regarding what we believed at that time to be ethically defensible uses of the psychopathy construct in legal settings. At this point in time, given the current state of the science concerning (1) problematic reliability of PCL-based assessments in field settings, (2) limited predictive validity of interpersonal and affective characteristics, and (3) the prejudicial effects of psychopathic traits and labels on attitudes concerning criminal defendants, we end this chapter with a more fundamental question: Should the forensic mental health field abandon the use of psychopathy assessments, and particularly PCL-R scores, to influence decision making concerning violence risk in criminal and civil commitment cases? If not, to what extent (if any) should the assessment of interpersonal and affective traits considered most central to psychopathy be included in these evaluations? Although some might accuse us of advocating that the field "throw out the baby with the bath water," there are many other means by which risk assessments can be conducted that do not require the scoring of Factor 1 items from the PCL-R. As in the previous version of this chapter, we hope that raising questions such as these will at least spark further discussion of whether and how to use psychopathy measures in settings in which they can have life-altering (or perhaps even life-ending) consequences.

#### REFERENCES

- American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (2014). *Standards for educational and psychological testing*. Washington, DC: American Educational Research Association.
- American Psychiatric Association. (2000). *Diagnostic* and statistical manual of mental disorders (4th ed., text rev.). Washington, DC: Author.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: Author.
- American Psychological Association. (2010). Ethical principles of psychologists and code of conduct. Retrieved September 25, 2016, from *www.apa.org/ethics/ code/index.aspx*.
- American Psychological Association. (2013). Specialty guidelines for forensic psychology. American Psychologist, 68(1), 7–19.
- Aspinwall, L. G., Brown, T. R., & Tabery, J. (2012). The double-edged sword: Does biomechanism increase or decrease judges' sentencing of psychopaths? *Science*, 337, 846–849.
- Asscher, J. J., van Vugt, E. S., Stams, G. M., Deković, M., Eichelsheim, V. I., & Yousfi, S. (2011). The relationship between juvenile psychopathic traits, delinquency and (violent) recidivism: A meta-analysis. *Journal of Child Psychology and Psychiatry*, 52(11), 1134–1143.
- Blais, J., & Forth, A. E. (2014a). Potential labeling effects: Influence of psychopathy diagnosis, defendant age, and defendant gender on mock jurors' decisions. *Psychology, Crime and Law, 20*(2), 116–134.
- Blais, J., & Forth, A. E. (2014b). Prosecution-retained versus court-appointed experts: Comparing and contrasting risk assessment reports in preventative detention hearings. *Law and Human Behavior*, 38(6), 531–543.
- Blais, J., Forth, A. E., & Hare, R. D. (2017). Examining the interrater reliability of the Hare Psychopathy Checklist—Revised across a large sample of trained raters. *Psychological Assessment*, 29(6), 762–775.
- Boccaccini, M. T., Murrie, D. C., Clark, J., & Cornell, D. (2008). Describing, diagnosing and naming psychopathy: How do youth psychopathy labels influ-

ence jurors? Behavioral Sciences and the Law, 26, 487–510.

- Boccaccini, M. T., Turner, D. B., & Murrie, D. C. (2008). Do some evaluators report consistently higher or lower scores on the PCL-R?: Findings from a state-wide sample of sexually violent predator evaluations. Psychology, Public Policy, and Law, 14, 262–283.
- Boccaccini, M. T., Turner, D. B., Murrie, D. C., & Rufino, K. A. (2012). Do PCL-R scores from state or defense experts best predict future misconduct among civilly committed sex offenders? *Law and Human Behavior*, 36, 159–169.
- Buffington-Vollum, J. K., Edens, J. F., Johnson, D. W., & Johnson, J. (2002). Psychopathy as a predictor of institutional misbehavior among sex offenders: A prospective replication. *Criminal Justice and Behavior*, 29, 497–511.
- Burdick v. Wolff, 796 N.W.2d 644 (N.D. 2011).
- Burke, J. D., Loeber, R., & Lahey, B. B. (2007). Adolescent conduct disorder and interpersonal callousness as predictors of psychopathy in young adults. *Journal* of Clinical Child and Adolescent Psychology, 36(3), 334–346.
- Caldwell, M. F. (2011). Treatment-related changes in behavioral outcomes of psychopathy facets in adolescent offenders. *Law and Human Behavior*, 35(4), 275–287.
- Caldwell, M. F., McCormick, D., Wolfe, J., & Umstead, D. (2012). Treatment-related changes in psychopathy features and behavior in adolescent offenders. *Criminal Justice and Behavior*, 39(2), 144–155.
- Caldwell, M., Skeem, J., Salekin, R., & Van Rybroek, G. (2006). Treatment response of adolescent offenders with psychopathy features: A 2-year follow-up. Criminal Justice and Behavior, 33, 571–596.
- Cauffman, E., & Skeem, J. L. (2004, March). The developmental (in)appropriateness of assessing juvenile psychopathy. Presentation at the biennial meeting of the American Psychology–Law Society, Scottsdale, AZ.
- Cooke, D. J., Hart, S. D., Logan, C., & Michie, C. (2004). Comprehensive Assessment of Psychopathy Personality—Institutional Rating Scale (CAPP-IRS). Unpublished manuscript, Department of Psychology, Glasgow Caledonian University, Glasgow, United Kingdom.
- Cox, J., Clark, J. C., Edens, J. F., Smith, S. T., & Magyar, M. S. (2013). Jury panel member perceptions of interpersonal–affective traits of psychopathy predict support for execution in a capital murder trial simulation. *Behavioral Sciences and the Law*, 31(4), 411–428.
- Cunningham, M. D., & Reidy, T. J. (2002). Violence risk assessment at federal capital sentencing: Individualization, generalization, relevance, and scientific standards. Criminal Justice and Behavior, 29, 512–537.
- Daubert v. Merrell-Dow Pharmaceuticals, Inc. 113 S.Ct. 2786 (1993).
- DeMatteo, D., & Edens, J. F. (2006). The role and relevance of the Psychopathy Checklist—Revised in

court: A case law survey of U.S. courts (1991–2004). Psychology, Public Policy, and Law, 12(2), 214–241.

- DeMatteo, D., Edens, J. F., Galloway, M., Cox, J., Smith, S. T., & Formon, D. (2014a). The role and reliability of the Psychopathy Checklist—Revised in sexually violent predator evaluations: A case law survey. *Law* and Human Behavior, 38(3), 248–255.
- DeMatteo, D., Edens, J. F., Galloway, M., Cox, J., Smith, S. T., Koller, J. P., et al. (2014b). Investigating the role of the Psychopathy Checklist–Revised in United States case law. Psychology, Public Policy, and Law, 20(1), 96–107.
- DeMatteo, D., Hodges, H., & Fairfax-Columbo, J. (2016). An examination of whether Psychopathy Checklist-Revised (PCL-R) evidence satisfies the relevance/prejudice admissibility standard. In B. Bornstein & M. Miller (Eds.), Advances in psychology and law (Vol. 2, pp. 205–239). New York: Springer.
- Douglas, K. S., Epstein, M. E., & Poythress, N. G. (2008). Criminal recidivism among juvenile offenders: Testing the incremental and predictive validity of three measures of psychopathic features. *Law and Human Behavior*, 32(5), 423–438.
- Douglas, K. S., Guy, L. S., Edens, J. F., Boer, D. P., & Hamilton, J. (2007). The Personality Assessment Inventory as a proxy for the Psychopathy Checklist— Revised: Testing the incremental validity and crosssample robustness of the Antisocial Features Scale. Assessment, 14(3), 255–269.
- Douglas, K. S., Hart, S. D., Webster, C. D., & Belfrage, H. (2013). HCR-20<sup>V3</sup>: Assessing risk for violence— User guide. Burnaby, Canada: Mental Health, Law, and Policy Institute, Simon Fraser University.
- Douglas, K. S., Nikolova, N. L., Kelley, S. E., & Edens, J. F. (2015) Psychopathy. In B. L. Cutler & P. A. Zapf (Eds.), APA handbook of forensic psychology: Vol. 1. Individual and situational influences in criminal and civil contexts (pp. 257–323). Washington, DC: American Psychological Association.
- Drislane, L. E., Patrick, C. J., & Arsal, G. (2014). Clarifying the content coverage of differing psychopathy inventories through reference to the Triarchic Psychopathy Measure. *Psychological Assessment*, 26, 350–362.
- D'Silva, K., Duggan, C., & McCarthy, L. (2004). Does treatment really make psychopaths worse?: A review of the evidence. *Journal of Personality Disorders*, 18(2), 163–177.
- Edens, J. F. (2001). Misuses of the Hare Psychopathy Checklist—Revised in court: Two case examples. *Journal of Interpersonal Violence*, 16, 1082–1093.
- Edens, J. F. (2006). Unresolved controversies concerning psychopathy: Implications for clinical and forensic decision-making. *Professional Psychology: Research* and Practice, 37, 59–65.
- Edens, J. F., Boccaccini, M. T., & Johnson, D. W. (2010). Inter-rater reliability of the PCL-R total and factor scores among psychopathic sex offenders: Are personality features more prone to disagreement than

behavioral features? *Behavioral Sciences and the Law*, 28, 106–119.

- Edens, J. F., Buffington-Vollum, J. K., Keilen, A., Roskamp, P., & Anthony, C. (2005). Predictions of future dangerousness in capital murder trials: Is it time to "disinvent the wheel"? *Law and Human Behavior*, 29, 55–86.
- Edens, J. F., & Cahill, M. A. (2007). Psychopathy in adolescence and criminal recidivism in young adulthood: Longitudinal results from a multiethnic sample of youthful offenders. Assessment, 14(1), 57–64.
- Edens, J. F., & Campbell, J. S. (2007). Identifying youths at risk for institutional misconduct: A meta-analytic investigation of the psychopathy checklist measures. *Psychological Services*, 4(1), 13–27.
- Edens, J. F., Campbell, J. S., & Weir, J. M. (2007). Youth psychopathy and criminal recidivism: A meta-analysis of the psychopathy checklist measures. *Law and Human Behavior*, 31(1), 53–75.
- Edens, J. F., Clark, J., Smith, S. T., Cox, J., & Kelley, S. E. (2013). Bold, smart, dangerous, and evil: Perceived correlates of core psychopathic traits among jury panel members. *Personality and Mental Health*, 7, 143–153.
- Edens, J. F., Colwell, L. H., Desforges, D. M., & Fernandez, K. (2005). The impact of mental health evidence on support for capital punishment: Are defendants labeled psychopathic considered more deserving of death? *Behavioral Sciences and the Law*, 23, 603–625.
- Edens, J. F., & Cox, J. (2012). Examining the prevalence, role and impact of evidence regarding antisocial personality, sociopathy, and psychopathy in capital cases: A survey of defense team members. *Behavioral Sciences and the Law*, 30(3), 239–255.
- Edens, J. F., Cox, J., Smith, S. T., DeMatteo, D., & Sörman, K. (2015). How reliable are Psychopathy Checklist—Revised scores in Canadian criminal trials?: A case law review. *Psychological Assessment*, 27(2), 447–456.
- Edens, J. F., Davis, K. M., Fernandez Smith, K., & Guy, L. S. (2013). No sympathy for the devil: Attributing psychopathic traits to capital murderers also predicts support for executing them. *Personality Disorders: Theory, Research, and Treatment*, 4, 175–181.
- Edens, J. F., Desforges, D. M., Fernandez, K., & Palac, C. A. (2004). Effects of psychopathy and violence risk testimony on mock juror perceptions of dangerousness in a capital murder trial. *Psychology, Crime & Law, 10, 393–412.*
- Edens, J. F., Guy, L. S., & Fernandez, K. (2003). Psychopathic traits predict attitudes toward a juvenile capital murderer. *Behavioral Sciences and the Law*, 21, 807–828.
- Edens, J. F., Hart, S. D., Johnson, D. W., Johnson, J., & Olver, M. E. (2000). Use of the Personality Assessment Inventory to assess psychopathy in offender populations. *Psychological Assessment*, 12, 132–139.
- Edens, J. F., Magyar, M. S., & Cox, J. (2013). Taking psy-

chopathy measures "out of the lab" and into the legal system: Some practical concerns. In K. Kiehl & W. Sinnot-Armstrong (Eds.), *Handbook on psychopathy and law* (pp. 250–272). New York: Oxford University Press.

- Edens, J. F., Marcus, D. K., Lilienfeld, S. O., & Poythress, N. G. (2006). Psychopathic, not psychopath: Taxometric evidence for the dimensional structure of psychopathy. *Journal of Abnormal Psychology*, 115(1), 131–144.
- Edens, J. F., Marcus, D. K., & Vaughn, M. G. (2011). Exploring the taxometric status of psychopathy among youthful offenders: Is there a juvenile psychopath taxon? Law and Human Behavior, 35(1), 13–24.
- Edens, J. F., Mowle, E., Clark, J., & Magyar, M. (2017). "A psychopath by any other name?": Juror perceptions of the DSM-5 "Limited Prosocial Emotions" specifier. *Journal of Personality Disorders*, 31(1), 90–109.
- Edens, J. F., & Petrila, J. (2006). Legal and ethical issues in the assessment and treatment of psychopathy. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 573– 588). New York: Guilford Press.
- Edens, J. F., Petrila, J., & Buffington-Vollum, J. K. (2001). Psychopathy and the death penalty: Can the Psychopathy Checklist—Revised identify offenders who represent "a continuing threat to society"? *Journal of Psychiatry and Law*, 29, 433–481.
- Edens, J. F., Poythress, N. G., Lilienfeld, S. O., & Patrick, C. J. (2008). A prospective comparison of two measures of psychopathy in the prediction of institutional misconduct. *Behavioral Sciences and the Law*, 26, 529–541.
- Edens, J. F., Skeem, J. L., Cruise, K. R., & Cauffman, E. (2001). Assessment of "juvenile psychopathy" and its association with violence: A critical review. Behavioral Sciences and the Law, 19, 53–80.
- Edens, J. F., & Vincent, G. M. (2008). Juvenile psychopathy: A clinical construct in need of restraint? *Journal of Forensic Psychology Practice*, 8, 186–197.
- Forth, A. E., Kosson, D., & Hare, R. D. (2003). Psychopathy Checklist: Youth Version technical manual. Toronto: Multi-Health Systems.
- Foster, S. L., & Cone, J. D. (1995). Validity issues in clinical assessment. Psychological Assessment, 7, 248–260.
- Freedman, D. (2001). False prediction of future dangerousness: Error rates and Psychopathy Checklist—Revised. Journal of the American Academy of Psychiatry and Law, 29, 89–95.
- Frick, P. J., & Moffitt, T. E. (2010). A proposal to the DSM-V childhood disorders and the ADHD and disruptive behavior disorders work groups to include a specifier to the diagnosis of conduct disorder based on the presence of callous-unemotional traits. Washington, DC: American Psychiatric Association.
- Frick, P. J., & Nigg, J. T. (2012). Current issues in the diagnosis of attention deficit hyperactivity disorder, oppositional defiant disorder, and conduct disorder. *Annual Review of Clinical Psychology*, 8, 77–107.
- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E.

(2014). Can callous–unemotional traits enhance the understanding, diagnosis, and treatment of serious conduct problems in children and adolescents?: A comprehensive review. *Psychological Bulletin, 140*, 1–57.

Frye v. United States, 293 F. 1013 (D.C. Cir. 1923).

- Furnham, A., Daoud, Y., & Swami, V., (2009). "How to spot a psychopath": Lay theories of psychopathy. Social Psychiatry and Psychiatric Epidemiology, 44, 464–472.
- Garcetti v. Superior Court, 85 Cal. App. 4th 508 (2000).
- Gardner, B. O., Boccaccini, M. T., Bitting, B. S., & Edens, J. F. (2015). Personality Assessment Inventory scores as predictors of misconduct, recidivism, and violence: A meta-analytic review. *Psychological Assessment*, 27(2), 534–544.
- Gendreau, P., Goggin, C., & Smith, P. (2002). Is the PCL-R really the "unparalleled" measure of offender risk? Criminal Justice and Behavior, 29(4), 397–426.
- Guay, J., Ruscio, J., Knight, R. A., & Hare, R. D. (2007). A taxometric analysis of the latent structure of psychopathy: Evidence for dimensionality. *Journal of Abnormal Psychology*, 116(4), 701–716.
- Guy, L. S., & Edens, J. F. (2003). Juror decision-making in a mock sexually violent predator trial: Gender differences in the impact of divergent types of expert testimony. *Behavioral Sciences and the Law*, 21, 215–237.
- Guy, L. S., & Edens, J. F. (2006). Gender differences in attitudes toward psychopathic sexual offenders. Behavioral Sciences and the Law, 24, 65–85.
- Guy, L. S., Edens, J. F., Anthony, C., & Douglas, K. S. (2005). Does psychopathy predict institutional misconduct among adults?: A meta-analytic investigation. *Journal of Consulting and Clinical Psychology*, 73(6), 1056–1064.
- Guy, L. S., Kusaj, C., Packer, I. K., & Douglas, K. S. (2015). Influence of the HCR-20, LS/CMI, and PCL-R on decisions about parole suitability among lifers. *Law and Human Behavior*, 39(3), 232–243.
- Hare, R. D. (1991). Hare Psychopathy Checklist—Revised manual. Toronto: Multi-Health Systems.
- Hare, R. D. (1996). Psychopathy: A clinical construct whose time has come. Criminal Justice and Behavior, 23(1), 25–54.
- Hare, R. D. (1998). The Hare PCL-R: Some issues concerning its use and misuse. *Legal and Criminological Psychology*, 3, 99–119.
- Hare, R. D. (2003). Hare Psychopathy Checklist—Revised manual (2nd ed.). Toronto: Multi-Health Systems.
- Hare, R. D., Black, P., & Walsh, Z. (2013). The PCL-R: Forensic applications and limitations. In R. P. Archer & E. M. Archer (Eds.), Forensic uses of clinical assessment instruments (2nd ed., pp. 266–290). New York: Routledge.
- Harris, G. T., Rice, M. E., & Cormier, C. A. (1994). Psychopaths: Is a therapeutic community therapeutic? *Therapeutic Communities*, 15, 283–299.

Harris, G. T., Rice, M. E., & Cormier, C. A. (2013).

Research and clinical scoring of the Psychopathy Checklist can show good agreement. *Criminal Justice and Behavior*, 40, 1349–1362.

- Harris, G., Rice, M., & Quinsey, V. (1994). Psychopathy as a taxon: Evidence that psychopaths are a discrete class. *Journal of Consulting and Clinical Psychology*, 62, 387–397.
- Harris, G., Skilling, T., & Rice, M. (2001). The construct of psychopathy. Crime and Justice, 28, 197–264.
- Hart, S. D. (1998). Psychopathy and risk for violence. In D. J. Cooke, A. E. Forth, & R. D. Hare (Eds.), Psychopathy: Theory, research, and implications for society (pp. 355–373). Dordrecht, The Netherlands: Kluwer.
- Hart, S. D., Cox, D. N., & Hare, R. D. (2005). Psychopathy Checklist: Screening Version (PCL: SV). Toronto: Multi-Health Systems.
- Hawes, S. W., Boccaccini, M. T., & Murrie, D. C. (2013). Psychopathy and the combination of psychopathy and sexual deviance as predictors of sexual recidivism: Meta-analytic findings using the Psychopathy Checklist—Revised. Psychological Assessment, 25(1), 233–243.
- Heilbrun, K. (1992). The role of psychological testing in forensic assessment. Law and Human Behavior, 16, 257–272.
- Heilbrun, K., Dvoskin, J., Hart, S., & McNiel, D. (1999). Violence risk communication: Implications for research, policy, and practice. *Health, Risk, and Society*, 1, 91–106.
- Helfgott, J. B. (1997, March). The popular conception of the psychopath: Implications for criminal justice policy and practice. Presentation at the annual convention of the Academy of Criminal Justice Sciences, Louisville, KY.
- Hoff, H. A., Rypdal, K., Mykletun, A., & Cooke, D. J. (2012). A prototypicality validation of the Comprehensive Assessment of Psychopathic Personality model (CAPP). *Journal of Personality Disorders*, 26(3), 414–427.
- Hoge, R. D., & Andrews, D. A. (2006). Youth Level of Service/Case Management Inventory: User's manual. Toronto: Multi-Health Services.
- In re Commitment of R.S., 773 A.2d 72 (N.J. Super. 2001).
- In re Detention of Holtz, 653 N.W.2d 613 (Iowa App. 2002).
- In the Interest of J.M., 713 N.W.2d 518 (N.D. 2006).
- Janus, S. (1998). Hendricks and the moral terrain of police power civil commitment. Psychology, Public Policy, and Law, 4, 297–322.
- Jeandarme, I., Edens, J. F., Habets, P., Bruckers, L., Oei, K., & Bogaerts, S. (2017). Psychopathy Checklist— Revised field validity in prison and hospital settings. *Law and Human Behavior*, 41(1), 29–43.
- Kansas v. Crane, 122 S. Ct. 867 (2002).
- Kansas v. Hendricks, 117 S. Ct. 2072 (1997).
- Kennealy, P. J., Skeem, J. L., Walters, G. D., & Camp, J. (2010). Do core interpersonal and affective traits of PCL-R psychopathy interact with antisocial behavior

and disinhibition to predict violence? *Psychological* Assessment, 22(3), 569–580.

- Leygraf, N., & Elsner, K. (2007). Risks of diagnosing psychopathic disorders. In A. Felthous & H. Sass (Eds.), The international handbook of psychopathic disorders and the law (pp. 135–146). New York: Wiley.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment*, 66, 488–524.
- Lilienfeld, S. O., & Fowler, K. (2006). The self-report assessment of psychopathy: Problems, pitfalls, and promises. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 107–132). New York: Guilford Press.
- Lilienfeld, S. O., & Widows, M. R. (2005). Psychopathic Personality Inventory—Revised: Professional Manual. Lutz, FL: Psychological Assessment Resources.
- Lloyd, C. D., Clark, H. J., & Forth, A. E. (2010). Psychopathy, expert testimony, and indeterminate sentences. *Legal and Criminological Psychology*, 15, 323–339.
- Loney, B. R., Taylor, J., Butler, M. A., & Iacono, W. G. (2007). Adolescent psychopathy features: 6-year temporal stability and the prediction of externalizing symptoms during the transition to adulthood. Aggressive Behavior, 33(3), 242–252.
- Lynam, D. R., Caspi, A., Moffitt, T. E., Loeber, R., & Stouthamer-Loeber, M. (2007). Longitudinal evidence that psychopathy scores in early adolescence predict adult psychopathy. *Journal of Abnormal Psychology*, 116(1), 155–165.
- Lynam, D. R., Charnigo, R., Moffitt, T. E., Raine, A., Loeber, R., & Stouthamer-Loeber, M. (2009). The stability of psychopathy across adolescence. *Development and Psychopathology*, 21(4), 1133–1153.
- Lyon, D. R., & Ogloff, J. R. P. (2000). Legal and ethical issues in psychopathy assessment. In C. Gacono (Ed.), The clinical and forensic assessment of psychopathy (pp. 139–173). Mahwah, NJ: Erlbaum.
- Melton, G. B., Petrila, J., Poythress, N. G., & Slobogin, C. (2007). Psychological evaluations for the courts (3rd ed.). New York: Guilford Press.
- Miller, A. K., Rufino, K. A., Boccaccini, M. T., Jackson, R. L., & Murrie, D. C. (2011). On individual differences in person perception: Raters' personality traits relate to their Psychopathy Checklist—Revised scoring tendencies. Assessment, 18, 253–260.
- Miller, C. S., Kimonis, E. R., Otto, R. K., Kline, S. M., & Wasserman, A. L. (2012). Reliability of risk assessment measures used in sexually violent predator proceedings. *Psychological Assessment*, 24, 944–953.
- Morey, L. C. (1991). Personality Assessment Inventory manual. Odessa, FL: Psychological Assessment Resources.
- Morse, S. J. (2014). Reflections on remorse. Journal of the American Academy of Psychiatry and the Law, 42(1), 49–55.
- Murrie, D. C., Boccaccini, M. T., Caperton, J., & Ru-

fino, K. (2012). Field validity of the Psychopathy Checklist—Revised in sex offender risk assessment. *Psychological Assessment*, 24, 524–529.

- Murrie, D. C., Boccaccini, M. T., Guarnera, L. A., & Rufino, K. (2013). Are forensic experts biased by the side that retained them? *Psychological Science*, 24, 1889–1897.
- Murrie, D. C., Boccaccini, M. T., Johnson, J., & Janke, C. (2008). Does interrater (dis)agreement on Psychopathy Checklist scores in sexually violent predator trials suggest partisan allegiance in forensic evaluations? Law and Human Behavior, 32, 353–362.
- Murrie, D. C., Marcus, D. K., Douglas, K. S., Lee, Z., Salekin, R. T., & Vincent, G. (2007). Youth with psychopathy features are not a discrete class: A taxometric analysis. *Journal of Child Psychology and Psychiatry*, 48(7), 714–723.
- Ogloff, J. R. P., & Lyon, D. R. (1998). Legal issues associated with the concept of psychopathy. In D. J. Cooke, A. E. Forth, & R. D. Hare (Eds.), *Psychopathy: Theo*ry, research, and implications for society (pp. 401–422). Dordrecht, The Netherlands: Kluwer.
- Olver, M. E., Stockdale, K. C., & Wormith, J. S. (2009). Risk assessment with young offenders: A meta-analysis of three assessment measures. *Criminal Justice and Behavior*, 36(4), 329–353.
- Otto, R. K., & Heilbrun, K. (2002). The practice of forensic psychology: A look toward the future in light of the past. *American Psychologist*, *57*, 5–18.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Development origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, 21, 913–938.
- Patrick, C. J., Venables, N. C., & Skeem, J. L. (2012). Psychopathy and brain function: Empirical findings and legal implications. In H. Häkkänen-Nyholm & J. Nyholm (Eds.), *Psychopathy and law: A practitioner's guide* (pp. 39–78). New York: Wiley.
- Polaschek, D. L. L., & Daly, T. E. (2013). Treatment and psychopathy in forensic setting. Aggression and Violent Behavior, 18(5), 592–603.
- Regier, D. A., Narrow, W. E., Clarke, D. E., Kraemer, H. C., Kuramoto, S. J, Kuhl, E. A., et al. (2013). DSM-5 field trials in the United States and Canada: Part 2. Test–retest reliability of selected categorical diagnoses. American Journal of Psychiatry, 170, 59–70.
- Rice, M. E., Harris, G. T., & Lang, C. (2013). Validation of and revision to the VRAG and SORAG: The Violence Risk Appraisal Guide—Revised (VRAG-R). *Psychological Assessment*, 25(3), 951–965.
- Rosenthal, R., & Rosnow, R. L. (1991). Essentials of behavioral research: Methods and data analysis (2nd ed.). New York: McGraw-Hill.
- Rufino, K. A., Boccaccini, M. T., Hawes, S. W., & Murrie, D. C. (2012). When experts disagree, who was correct?: A comparison of PCL-R scores from independent raters and opposing forensic experts. *Law* and Human Behavior, 36(6), 527–537.
- Salekin, R. T., Rogers, R., & Sewell, K. W. (1997). Con-

struct validity of psychopathy in a female offender sample: A multitrait–multimethod evaluation. *Journal of Abnormal Psychology*, 106, 576–585.

- Salekin, R. T., Worley, C., & Grimes, R. D. (2010). Treatment of psychopathy: A review and brief introduction to the mental model approach for psychopathy. *Behavioral Sciences and the Law*, 28, 235–266.
- Skeem, J. L., Manchak, S. M., Lidz, C. W., & Mulvey, E. P. (2013). The utility of patients' self-perceptions of violence risk: Consider asking the person who may know best. *Psychiatric Services*, 64(5), 410–415.
- Skeem, J. L., & Mulvey, E. P. (2001). Psychopathy and community violence among civil psychiatric patients: Results from the MacArthur Violence Risk Assessment Study. Journal of Consulting and Clinical Psychology, 69, 358–374.
- Skeem, J. L., Polaschek, D. L. L., & Manchak, S. (2009). Appropriate treatment works, but how?: Rehabilitating general, psychopathic, and high risk offenders. In J. L. Skeem, K. S. Douglas, & S. O. Lilienfeld (Eds.), *Psychological science in the courtroom: Controversies and consensus* (pp. 358–384). New York: Guilford Press.
- Smith, S. T., Edens, J. F., Clark, J., & Rulseh, A. (2014). "So, what *is* a psychopath?": Venireperson perceptions, beliefs, and attitudes about psychopathic personality. *Law and Human Behavior*, 38, 490–500.
- State v. Anderson, 730 N.W.2d 570 (N.D. 2007).
- Stitt v. United States, 369 F. Supp. 2d 679 (E. D. Va. 2005).
- Sturup, J., Edens, J. F., Sörman, K., Karlberg, D., Fredriksson, B., & Kristiansson, M. (2014). Field reliability of the Psychopathy Checklist—Revised among life sentenced prisoners in Sweden. Law and Human Behavior, 38, 315–324.
- Sundby, S. E. (1998). The capital jury and absolution: The intersection of trial strategy, remorse, and the death penalty. Cornell Law Review, 83, 1557–1598.
- Tex. Health & Safety Code, § 841.023 (Vernon 2004).
- Tyrer, P., Cooper, S., Seivewright, H., Duggan, C., Rao, B., & Hogue, T. (2005). Temporal reliability of psychological assessments for patients in a special hospital with severe personality disorder: A preliminary note. Criminal Behaviour and Mental Health, 15(2), 87–92.
- United States v. Richardson, Case No. 1:08-CR-0139-CC, N. D. Ga., Docket No. 596 (January 19, 2012).
- Vidal, S., & Skeem, J. L. (2007). Effect of psychopathy, abuse, and ethnicity on juvenile probation officers' decision-making and supervision strategies. *Law and Human Behavior*, 31, 479–498.
- Viljoen, J. L., MacDougall, E. A. M., Gagnon, N. C., & Douglas, K. S. (2010). Psychopathy evidence in legal proceedings involving adolescent offenders. *Psychol*ogy, *Public Policy, and Law*, 16(3), 254–283.

- Viljoen, J. L., McLachlan, K., & Vincent, G. M. (2010). Assessing violence risk and psychopathy in juvenile and adult offenders: A survey of clinical practices. Assessment, 17(3), 377–395.
- Vincent, G. M., & Hart, S. D. (2012). Legal uses and assessment of psychopathy. In D. Faust (Ed.), Coping with psychiatric and psychological testimony: Based on the original work by Jay Ziskin (pp. 563–586). New York: Oxford University Press.
- Walsh, T., & Walsh, Z. (2006). The evidentiary introduction of Psychopathy Checklist-Revised assessed psychopathy in U.S. courts: Extent and appropriateness. Law and Human Behavior, 30(4), 493–507.
- Walters, G. D. (2006). Risk-appraisal versus self-report in the prediction of criminal justice outcomes: A meta-analysis. Criminal Justice and Behavior, 33(3), 279–304.
- Walters, G. D., Duncan, S., & Geyer, M. (2003). Predicting disciplinary adjustment in inmates undergoing forensic evaluation: A direct comparison of the PCL-R and PAI. Journal of Forensic Psychiatry and Psychology, 14, 382–292.
- Walters, G. D., Duncan, S. A., & Mitchell-Perez, K. (2007). The latent structure of psychopathy: A taxometric investigation of the Psychopathy Checklist— Revised in a heterogeneous sample of male prison inmates. Assessment, 14(3), 270–278.
- Walters, G. D., Knight, R. A., Grann, M., & Dahle, K. P. (2008). Incremental validity of the Psychopathy Checklist facet scores: Predicting release outcome in six samples. *Journal of Abnormal Psychology*, 117(2), 396–405.
- Walters, G. D., Marcus, D. K., Edens, J. F., Knight, R. A., & Sanford, G. (2011). In search of the psychopathic sexuality taxon: Indicator size does matter. *Behavioral Sciences and the Law*, 29(1), 23–39.
- Wash. Laws, § 71-09-010 (2000).
- Wong, S. C. P., Gordon, A., Gu, D., Lewis, K., & Olver, M. E. (2012). The effectiveness of violence reduction treatment for psychopathic offenders: Empirical evidence and a treatment model. *International Journal of Forensic Mental Health*, 11(4), 336–349.
- Yang, M., Wong, S. C. P., & Coid, J. (2010). The efficacy of violence prediction: A meta-analytic comparison of nine risk assessment tools. *Psychological Bulletin*, 136(5), 740–767.
- Zhong, R., Baranoski, M., Feigenson, N., Davidson, L., Buchanan, A.,& Zonana, H. V. (2014). So you're sorry?: The role of remorse in criminal law. *Journal* of the American Academy of Psychiatry and the Law, 42(1), 39–48.
- Zinger, I., & Forth, A. E. (1998). Psychopathy and Canadian criminal proceedings: The potential for human rights abuses. *Canadian Journal of Criminol*ogy, 40, 237–277.

# PART VII

# CONCLUSIONS AND FUTURE DIRECTIONS

### CHAPTER 31

## Understanding Psychopathy Where We Are, Where We Can Go

DUSTIN B. WYGANT DUSTIN A. PARDINI ABIGAIL A. MARSH CHRISTOPHER J. PATRICK

ur aim in this closing chapter is to highlight some issues of continuing importance to the field and to propose some specific avenues for future research that can help address these issues and improve coordination of ongoing investigative efforts. The chapter begins with a section on assessment by Dustin Wygant. A major focus of this section is on the trait-based system for personality pathology included in the current, fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association [APA], 2013), and the opportunities this alternative trait system creates for the study of psychopathy. In the second section of the chapter, Dustin Pardini discusses major unresolved issues in the developmental literature on psychopathy, including when features of psychopathy first arise in life, how stable they are across time, gaps in our understanding of etiology, and uncertainties regarding the effectiveness of existing treatments. This section also includes coverage of the new "limited prosocial emotions" specifier for conduct disorder (CD) in DSM-5. Following this is a section on neuroimaging research, in which Abigail Marsh describes strengths and limitations of neuroimaging methodology, with a particular focus on magnetic resonance imaging (MRI),

and highlights key issues pertaining to research of this type—including replicability, real-world utility of findings, and ethical considerations. In the final section of the chapter, Christopher J. Patrick proposes an integrative agenda for continuing research in the field that draws on the perspectives provided by Wygant, Pardini, and Marsh, along with issues and ideas discussed by other contributors to this volume.

#### New Directions in Clinical Assessment of Psychopathy

#### **Diagnostic Issues**

While psychopathy has long been an important clinical construct, the fields of psychiatry and psychology have struggled over the years with how to best conceptualize and diagnose individuals exhibiting psychopathic tendencies. The first two editions of the DSM included diagnostic descriptions that appear more in line with classic (Cleckley, 1941/1976; Karpman, 1941) and contemporary conceptualizations of psychopathy (e.g., Hare, 2003; Lilienfeld & Widows, 2005; Patrick & Drislane, 2015b). DSM-I (American Psychiatric Association [APA], 1952) referenced an "antisocial reaction" variant of a broader "sociopathic personality disturbance" diagnosis, encompassing not only antisocial behavior at odds with societal values and norms but also features including poor judgment, failure to profit from experience or punishment, emotional immaturity, callousness and hedonism, absence of a sense of responsibility, and lack of loyalty to others. The manual for DSM-I specifically noted that this category was intended to include individuals who previously had been diagnosed with constitutionally based ("primary") psychopathic personality (cf. Karpman, 1941).

DSM-II (APA, 1968) used the alternative designation "antisocial personality," but the diagnostic criteria remained aligned with classic clinical descriptions of psychopathy (Cleckley, 1941/1976), including features of extreme selfishness, irresponsibility, callousness toward others, lack of capacity for guilt, and seeming inability to learn from adverse experience or punishment. Like DSM-I, DSM-II specified that merely exhibiting a history of criminal behavior was not sufficient to warrant the diagnosis.

While these two characterizations of antisocial personality were similar in conception to Cleckley's (1941/1976) classic description of psychopathy, they lacked interrater reliability, owing to their reliance on prototype matching (i.e., perceived resemblance to a text description of a prototypical clinical case) as opposed to explicit diagnostic criteria. In line with the general effort to improve diagnostic reliability through use of explicit criteria in the third edition of the DSM (APA, 1980), "antisocial personality disorder" (ASPD) was defined in DSM-III by the occurrence during adulthood of specific behaviors indicative of irresponsibility, aggression, unlawful behavior, recklessness, and impulsivity. Along with adult behavioral deviancy, the presence of conduct problems prior to age 15 was required to indicate the temporal persistence of the behavioral disturbance. The next version of the manual, DSM-III-R (APA, 1987), maintained the behavioral criteria from DSM-III but added an additional criterion of lacking in remorse for one's behavior. The definition of ASPD in the fourth edition of the DSM (DSM-IV; APA, 1994) was similar to that of DSM-III-R in its coverage of various externalizing behaviors, and sought to link the diagnosis of ASPD to psychopathy by describing associated features of glibness, superficial charm, callousness, and deficient empathy. However, these features were mentioned only in the accompanying text for the diagnosis and were not among the actual diagnostic criteria. The symptom criteria for ASPD in the main "Diagnostic Criteria and Codes" (Section II) in the current, fifth DSM edition (DSM-5; APA, 2013) remain identical to those in DSM-IV.

Empirical research has amply documented that the diagnostic criteria for ASPD since DSM-III are not specific to psychopathy (Hare, 1996; Lynam & Vachon, 2012; Patrick & Drislane, 2015a; Widiger & Crego, Chapter 12, this volume), particularly in reference to what Karpman (1941) and others (e.g., Lykken, 1995) referred to as "primary psychopathy." Lilienfeld and Landfield (2008) referenced Loevinger's (1957) concept of attenuation paradox in discussing how the emphasis on increased interrater reliability in DSM-III and DSM-IV came at the expense of attenuated validity, with ASPD diverging from its original target of psychopathy as classically described. The divergence between ASPD and psychopathy is evident in prevalence studies indicating that between 50 and 80% of incarcerated male offenders meet diagnostic criteria for ASPD, whereas only 20-25% of such individuals meet criteria for psychopathy as defined by Hare's (2003) Psychopathy Checklist-Revised (PCL-R; e.g., Hare, Hart, & Harpur, 1991). Moreover, while available evidence indicates that psychopathy has distinct neurobiological correlates indicative of dysfunction in cognitive-affective circuitry of the brain (see Blair, Meffert, Hwang, & White, Chapter 17, and Patrick, Chapter 18, this volume), ASPD criteria identify a more heterogeneous group of individuals whose antisocial behavior is associated with psychosocial factors including economic adversity, low educational and occupational attainment, and deviant peer groups (Farrington & Bergstrøm, Chapter 15, this volume), as well as with impaired frontal executive function (Morgan & Lilienfeld, 2000).

Extending prior work, recent studies by Venables, Hall, and Patrick (2014) and Wall, Wygant, and Sellbom (2015) directly examined whether particular constituent traits of psychopathy differentiate this condition as assessed by Hare's PCL-R from ASPD as defined in DSM-IV and Section II of DSM-5. Utilizing correctional samples, both studies found that boldness, a dispositional construct described in the triarchic model of psychopathy (Patrick, Fowles, & Krueger, 2009) that reflects social dominance, imperviousness to stress, and fearless thrill seeking distinguished PCL-R psychopathy from DSM-IV ASPD. Data from these studies (together with other findings) indicate that boldness is represented most strongly in the Interpersonal items of the PCL-R—which include features such as glibness/charm and grandiosity not covered at all by the symptom criteria for ASPD in DSM IV/DSM-5, which instead strongly represent aspects of disinhibition and meanness to some degree.

Given the foregoing considerations, it seems likely that much of the existing empirical work on the conception of ASPD introduced in DSM-III (APA, 1980) has limited relevance to the more specific diagnosis of psychopathy. Continuing reliance on the symptom criteria for ASPD in Section II of DSM-5 will operate to perpetuate this situation. However, two diagnostic innovations in DSM-5 create avenues for the study of psychopathy within this nosological framework. These innovations are discussed next.

#### Psychopathy in DSM-5

One major innovation in DSM-5 is the inclusion of a "limited prosocial emotions" (LPE) specifier for the childhood diagnosis of CD, developed by the Disruptive Behavior Disorders Workgroup, in Section II of the manual. This specifier, as discussed in the section below on issues and directions for developmental research on psychopathy, provides a means for identifying a subset of youth meeting criteria for CD who exhibit callous-unemotional traits specifically indicative of psychopathy (Frick, Ray, Thornton, & Kahn, 2014a). The study of this subgroup of youth provides for a direct interface between research on DSM-defined CD and work on psychopathy in children and adolescents as defined by other assessment instruments (see Salekin, Andershed, & Clark, Chapter 20, this volume).

The other major psychopathy-related innovation in DSM-5 is the inclusion of an alternative system for characterizing personality pathology in Section III of the manual. Specifically, prior to the release of this edition of the DSM in 2013, the Personality and Personality Disorders (PPD) Workgroup for DSM-5 proposed a sweeping change in the system for characterizing personality pathology, from discrete categorical diagnoses to a dimensional model that focuses on continuous personality traits, along with measured impairments in core aspects of functioning (self, interpersonal). However, in the final months leading up to the release of DSM-5, the Board of Trustees of the APA decided to retain the DSM-IV categorical system for personality disorders in DSM-5 Section II, and place the hybrid dimensional-trait system in Section III of the manual (titled "*Emerging Measures and Models*") as a framework for further study.

One component of the DSM-5 Section III system for personality pathology, Criterion A, focuses on impairment in self (identity or self-direction) and interpersonal (empathy or intimacy) functioning that is specifically tailored for each personality disorder (APA, 2013). With regard to ASPD, impairment in self-functioning is characterized by egocentricity, along with absence of internal prosocial standards and failure to conform to lawful behavior. Interpersonal dysfunction is characterized by an absence of concern for others, lack of remorse, exploitativeness, and use of deceit, coercion, dominance, and intimidation (APA, 2013). Impairments in these areas can be assessed using a Levels of Personality Functioning Scale developed by the DSM-5 PPD Workgroup (for details, see Few et al., 2013). Criterion B pertains to the presence of pathological personality traits within five broad domains-Negative Affectivity, Detachment, Antagonism, Disinhibition, and Psychoticism (APA, 2013)-encompassing three to seven narrower (facet) traits each. The Criterion B trait domains resemble broad dimensions of the five-factor model (FFM) of personality as represented in inventories such as the NEO Personality Inventory-Revised (NEO-PI-R; Costa & Mc-Crae, 1992) and the Personality Psychopathology Five (PSY-5; Harkness, Finn, McNulty, & Shields, 2012). Two approaches that exist for assessing the Criterion B traits of DSM-5 Section III are a Clinicians' Personality Trait Rating form developed by the PPD Workgroup (cf. Few et al., 2013) and a 220-item self-report questionnaire, the Personality Inventory for DSM-5 (PID-5), developed by PPD Workgroup members Krueger and Skodol along with their colleagues (2012).

In addition to specifying distinct forms of Criterion A impairment for each personality disorder, the DSM-5 PPD Workgroup also selected specific Criterion B traits as characteristic of each. ASPD, for example, is defined by the presence of manipulativeness, deceitfulness, callousness, and hostility from the domain of Antagonism, and irresponsibility, impulsivity, and risk-taking from the domain of Disinhibition. Thus, to be diagnosed with ASPD, an individual would have to show elevations on at least six of these seven facet traits, along with moderate to high impairment in at least two of four areas of personality functioning (identity, self-direction, empathy, intimacy) as pertinent to ASPD. Furthermore, the Section III trait system in DSM-5 includes a psychopathy specifier for ASPD (i.e., for indicating ASPD with primary psychopathic features) that emphasizes traits not included among the seven specified for ASPD. These traits include high attention seeking and low withdrawal, along with low anxiousness, a configuration reflecting a socially potent interpersonal style coupled with high stress immunity. In turn, these traits are indicative of the boldness (or fearless dominance; Lilienfeld & Widows, 2005) component of psychopathy represented in Cleckley's (1941/1976) classic account of the disorder (see Crego & Widiger, 2016; Patrick, Chapter 1, this volume) and in various contemporary instruments for assessing it (Patrick et al., 2009; Patrick & Drislane, 2015b).

Wygant and Sellbom (2012) examined associations between DSM-5 Section III trait domains, indexed via the PSY-5 model, and scores on the Psychopathy Checklist: Screening Version (PCL:SV; Hart, Cox, & Hare, 1995) in a sample of 99 criminal defendants undergoing forensic psychological evaluations. PSY-5 Aggressiveness, which is analogous to Section III Antagonism, was strongly associated with total scores on the PCL:SV, as well as scores on its two parts and four facets (corresponding to Factors 1 and 2 and Facets 1-4, respectively, of the PCL-R; Hare, Neumann, & Mokros, Chapter 3, this volume), whereas PSY-5 Disconstraint (analogous to Section III Disinhibition) was preferentially associated with the PCL:SV's impulsive-behavioral facet. These results provide support for the selection of antagonism and disinhibition as trait domains for defining ASPD in DSM-5 Section III. Wygant and Sellbom (2012) also found that lower levels of PSY-5 Negative Emotionality (Section III Negative Affectivity) were related to the Interpersonal (Facet 1) and Affective (Facet 2) symptom components of psychopathy as assessed by the PCL:SV.

Strickland, Drislane, Lucy, Krueger, and Patrick (2013) examined associations between DSM-5 Section III facet traits, assessed using the PID-5, and scale measures of the triarchic model constructs in a mixed community and college sample. They found that psychopathic traits indicative of callous aggression (i.e., meanness) and externalizing proneness (disinhibition) were captured effectively by traits specified in the Section III definition for ASPD. With regard to boldness, two of the Section III traits used to define ASPD (risk taking and manipulativeness), along with the traits

comprising the Section III psychopathy specifier (i.e., attention seeking, withdrawal [–], anxiousness[–]), were related to this facet of psychopathy.

While the Wygant and Sellbom (2012) and Strickland and colleagues (2013) studies demonstrated relevance of the Section III pathological traits to different models of psychopathy, these studies did not directly compare ASPD as defined in DSM-5 Section III with its categorical counterpart as defined in Section II. However, three subsequent studies have directly compared DSM-5 Section II and III diagnoses of ASPD in terms of their relations with established measures of psychopathy. Anderson, Sellbom, Wygant, Salekin, and Krueger (2014) compared associations of these two versions of ASPD as assessed by self-report with two self-report measures of psychopathic traits. Section II and III ASPD were assessed using the Screening Personality Questionnaire for the Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II; First, Gibbon, Spitzer, Williams, & Benjamin, 1997) and the PID-5, respectively; psychopathic traits were assessed using the Psychopathic Personality Inventory-Revised (PPI-R; Lilienfeld & Widows, 2005) and the Triarchic Psychopathy Measure (TriPM; Drislane, Patrick, & Arsal, 2014). These investigators found that Section III ASPD was related more strongly to psychopathy scores than was Section II ASPD. Moreover, the Section III psychopathy specifier contributed incrementally to prediction of psychopathy scores over and above the two versions of ASPD, particularly with regard to scores on the fearless dominance (PPI) or boldness (TriPM) component of psychopathy. Few, Lynam, Maples, MacKillop, and Miller (2015) compared associations of ASPD as defined in Sections II and III of DSM-5 with psychopathic symptoms in a sample of 106 adults seeking outpatient treatment for psychological problems. While both operationalizations of ASPD showed robust predictive relations with psychopathy, the Section III trait model outperformed the Section II criterion-based model. Additionally, the authors found that the traits comprising the Section III psychopathy specifier contributed over and above ASPD-relevant traits in predicting affective-interpersonal ("fearless dominant") symptoms of psychopathy, but not impulsive-antisocial symptoms.

Wygant and colleagues (2016) compared DSM-5 Section II and III versions of ASPD in terms of their relations with psychopathy measures in a sample of 200 incarcerated male offenders. A notable strength of this study was that Section III ASPD and psychopathy were both assessed through diagnostic interview (Clinicians' Personality Trait Rating for Section III ASPD; PCL-R for psychopathy), as well as by self-report (PID-5 for Section III ASPD; PPI-R and TriPM for psychopathy). Section II ASPD was assessed using the SCID-II interview protocol. Analyses demonstrated that Section III ASPD, as assessed by interview, predicted scores on the PCL-R to a substantially higher degree than interview-assessed Section II ASPD. In addition, consistent with the findings of Anderson and colleagues (2014) and Strickland and colleagues (2013), Section III ASPD traits assessed via self-report (i.e., PID-5) accounted for appreciable variance in scores on the PPI-R and TriPM—showing robust relations with subscales of each reflecting triarchic constructs of meanness and disinhibition. The Section III psychopathy specifier showed its strongest association with the Interpersonal (glib, grandiose, manipulative-deceitful) facet of the PCL-R when assessed via interview (i.e., Clinicians' Trait Rating protocol), and with the Fearless Dominance and Boldness facets, respectively, of the PPI-R and TriPM when assessed through self-report (i.e., PID-5). A further notable finding of this study was that the Section III ASPD impairment criteria contributed incrementally over the Section III ASPD traits in predicting both PCL-R psychopathy and Section II ASPD (assessed using the SCID-II).

Collectively, findings from these recent studies provide evidence that the dimensional diagnosis of ASPD in DSM-5 Section III offers effective traitbased coverage of psychopathy and its facets, along lines consistent with the triarchic model. Moreover, the findings of Anderson and colleagues (2014), Few and colleagues (2015), and Wygant and colleagues (2016) suggest that the Section III version of ASPD appears to be better aligned with various conceptualizations of psychopathy (PCL-R, PPI-R, TriPM) than the behavioral-criterion-based model in DSM-5 Section II that was carried over from DSM-IV. However, as noted by Lynam and Vachon (2012), key issues need to be addressed empirically before the Section III model is fully adopted for clinical use-including some adjustments to facet traits composing the ASPD diagnosis and the psychopathy specifier, suggested by findings from the previously mentioned studies. Additional research is also needed to determine the extent to which specific assessment of personality impairment is needed in the alternative trait model. Relevant to this, Sleep, Wygant, and Miller (2017) found within a sample of 200 female correctional inmates that the impairment criterion of the alternative personality disorder model added very little unique variance beyond personality traits in predicting elements of psychopathy.

#### Linking Psychopathy Research to Cross-Domain Assessment Initiatives

Another potential merit of the trait-based system for personality pathology in DSM-5 Section III is that it provides a framework for connecting research on psychopathy to major scientific initiatives calling for incorporation of data from neural and behavioral domains into clinical and applied assessments. One of these is the National Institute of Mental Health's (NIMH) Research Domain Criteria (RDoC) project (Cuthbert & Kozak, 2013), which seeks to establish a new classification system for mental illness based on neuroscientific knowledge of behavior, to replace the current DSM system. Specifically, the RDoC project calls for psychopathology researchers to investigate transdiagnostic symptom dimensions rather than specific disorders, in terms of core biobehavioral processes (i.e., positive affect, negative affect, cognition, social interaction, arousal/bodily regulation) quantified using variables from multiple domains of assessment (e.g., genetic, molecular, neuroanatomic, physiological, behavioral, selfreport). Two other initiatives of this kind, focusing on multidomain assessment, are the National Institute on Alcohol Abuse and Alcoholism's (NIAAA) Alcohol Addiction Research Domain Criteria project (AARDoC; Kwako, Momenan, Litten, Koob, & Goldman, 2016; Litten et al., 2015) and the Human Capabilities research agenda of the United States Army's Research Institute for the Social and Behavioral Sciences (National Research Council, Committee on Measuring Human Capabilities: Performance Potential of Individuals and Collectives, Board on Behavioral, Cognitive, and Sensory Sciences, Division of Behavioral and Social Sciences and Education, 2015).

The DSM-5 Section III trait system for personality pathology has the potential to connect ongoing research on psychopathy with NIMH's call for investigation of mental health problems in terms of core neurobehavioral processes. As noted in the preceding section, recent research demonstrates that traits from the Section III system can be used to index psychopathy facets of boldness, meanness, and disinhibition as specified by the triarchic model (Anderson et al., 2014; Strickland et al., 2013; Wygant & Sellbom, 2012; Wygant et al., 2016), which are framed in neurobehavioral terms (Patrick & Drislane, 2015b) and correspond to specific constructs in the RDoC framework (i.e., acute threat ("fear"), response inhibition, and affiliation/attachment, respectively). Considerable research has been done with adult samples to identify converging neurophysiological and behavioral indicators of boldness (operationalized in some cases as fear/fearlessness) and disinhibition (e.g., Benning, Patrick, & Iacono, 2005; Nelson, Patrick, & Bernat, 2011; Patrick et al., 2013; Yancey, Venables, & Patrick, 2016), and research with child and adolescent samples (along with some more recent adult work; e.g., Brislin, Yancey, et al., 2017) has documented neurophysiological and behavioral correlates of meanness (conceptualized as "callous-unemotional" traits). The ability to effectively index the triarchic model constructs using traits from the DSM-5 Section III system will provide new opportunities for researchers who use this official diagnostic nosology to investigate aspects of psychopathy in ways that link to the NIMH RDoC framework and other multidomain assessment initiatives.

#### Psychopathy and Development: Unresolved Questions and Avenues for Research

#### Delineating Psychopathic Features across Development

Over the past two decades, there have been intensive efforts to identify early developmental manifestations of adult psychopathic symptoms. This research has provided extensive evidence indicating that features consistent with the interpersonal (e.g., grandiose, manipulative, deceitful), affective (e.g., callous, unemotional), and lifestyle (e.g., impulsive, irresponsible, sensation seeking) symptom dimensions of adult psychopathy can be reliably assessed in children and adolescents (Colins et al., 2014; Frick, Bodin, & Barry, 2000; Hawes, Mulvey, Schubert, & Pardini, 2014). Also consistent with research on adult psychopathy, evidence suggests these three dimensions can be differentiated from one another using parent- and teacher-report scales in childhood (Colins et al., 2014; Frick, Bodin, & Barry, 2000), as well as self-report and interviewer-rated instruments in later adolescence (Hawes, Mulvey, et al., 2014; Neumann, Kosson, Forth, & Hare, 2006).

Despite these advances, it is unclear at what point during early development these phenotypic dimensions can be reliably differentiated from one another, achieve relative stability, and become risk factors for later psychopathology. Some evidence suggests that individual differences in affective discomfort following wrongdoing and concern for the well-being of others can be reliably assessed in children as young as 3 years of age (Colins et al., 2014; Kochanska, Forman, Aksan, & Dunbar, 2005; Zahn-Waxler & Kochanska, 1990). Similarly, tendencies toward impulsivity, hyperactivity, and proneness to boredom begin to emerge as a distinct dimension of temperament around the same developmental period, with extreme levels of these tendencies being prognostic of attention-deficit/ hyperactivity disorder (Nigg, 2006). Longitudinal studies have also found that callous-unemotional features and impulsive/hyperactive/inattentive behaviors in toddlers predict the later development of conduct problems (Brennan, Shaw, Dishion, & Wilson, 2015; Waller et al., 2014), although the magnitude of these associations is generally small.

It is less clear at what point in development early features associated with the interpersonal dimension of psychopathy (e.g., charm, deceitfulness, conning, grandiose sense of self-worth) attain distinct psychopathological form. Studies have revealed that by around age 3 children display a basic understanding that lying on purpose to cover up misdeeds is morally wrong (Talwar, Lee, Bala, & Lindsay, 2002), but deceitful behavior remains relatively common among toddlers (Talwar & Lee, 2002). On the other hand, preschool-age children do not possess the cognitive capability to convincingly maintain a lie upon questioning (Talwar, Gordon, & Lee, 2007), making it unlikely that they can skillfully use deception to con or manipulate others. Similarly, some evidence suggests that early manifestations and adverse outcomes associated with individual differences in maladaptive narcissism (i.e., sense of superiority, entitlement) may not emerge until around age 8 (Thomaes, Brummelman, Reijntjes, & Bushman, 2013). However, Colins and colleagues (2014) found that grandiose/deceitful behaviors can be reliably assessed and differentiated from callousunemotional and impulsive behaviors in children as young as age 3.

#### Continuity in Psychopathic Features across Development

A substantial number of longitudinal studies have now examined the stability of psychopathic features over periods of varying duration from childhood to early adulthood. Parent-report measures indexing features of psychopathy tend to exhibit high stability across periods spanning a few years (Pardini & Byrd, 2013), and parent- and youth-report measures of psychopathic features have shown moderate stability across temporal lags up to 7 years collectively spanning from childhood to the mid-20s (Hawes, Mulvey, et al., 2014; Obradović, Pardini, Long, & Loeber, 2007). Studies using different informants to assess psychopathic features across time (e.g., teachers) generally find lower stability estimates, with low to moderate correlations (r = .27-.31) being reported across temporal periods spanning 7–10 years (Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007; Obradović et al., 2007). Collectively, these studies have vielded no consistent evidence that the temporal stability of psychopathic features changes from childhood to adulthood, or that certain dimensions of psychopathy are more stable than others.

Based on this existing body of work, researchers often emphasize that psychopathic features are relatively stable across development. However, studies using person-based approaches indicate that dramatic changes in these features do occur for a subset of youth. For example, research indicates that between 66% and 88% of school-age children with initially high levels of callous-unemotional (CU) traits exhibit precipitous declines in these features over time (Fontaine, Rijsdijk, McCrory, & Viding, 2010; Klingzell et al., 2016). These same studies show that approximately 10% of school-age children with initially low levels of CU features exhibit rapid increases in these behaviors over the same developmental period. Other work has shown that significant changes in psychopathic features also continue to occur from adolescence into early adulthood. For example, in one longitudinal study, Lynam and colleagues (2007) found that only 21% of community-dwelling boys who were rated in the upper 10th percentile on a parent-report measure of psychopathy at age 13 scored within the diagnostic range on the PCL:SV at age 24. Similarly, in a longitudinal study of serious juvenile offenders, Hawes, Mulvey, and colleagues (2014) found that only 14% of youth who scored in the upper 10th percentile on a self-report measure of psychopathy in their late teens scored within the upper 50th percentile on the same measure at a 7-year follow-up. These findings highlight the important of exercising caution when referring to psychopathic features as "traits," as it may convey the faulty impression that these characteristics are largely immutable in children and adolescents.

Moving forward, several key issues regarding the developmental stability of psychopathic traits still need to be addressed. For example, it is unclear whether the behavioral indicators used to quantify psychopathic features index the same underlying construct across disparate developmental periods (i.e., show longitudinal invariance). If certain behaviors become increasingly indicative of the construct of psychopathy from early childhood to adolescence (e.g., lying), then fluctuations in scores across time for scales that include these behaviors may not represent "true" changes in the underlying construct. Although studies examining the issue of longitudinal measurement invariance remain relatively rare, there is some evidence that a common set of parent- and teacher-report items can be used to assess aspects of the interpersonal and affective features of psychopathy in an invariant manner from ages 7-16 (Obradović et al., 2007). Similarly, Hawes, Mulvey, and colleagues (2014) found that a self-report measure tapping the interpersonal, affective, and lifestyle dimensions of psychopathy exhibited evidence of longitudinal invariance from the late teens to the mid-20s. However, there is also some evidence that items assessing callous and deceitful behaviors may not operate as stable indicators of an underlying psychopathy construct across the preschool years (Hyde et al., 2013).

It is also important to note that some assessment instruments may not be well suited to examining changes in psychopathic features over time without scoring modifications. For example, the youth and adult versions of the Psychopathy Checklist (Forth, Kosson, & Hare, 2003; Hare, 2003) instruct interviewers to rate items based on an individual's overall level of lifetime function. However, it is not clear at what point changes in behavior are consistent enough to warrant rating modifications, especially given concerns that psychopathic individuals may feign emotions or endeavor to present themselves in a favorable light. Similarly, longitudinal studies using parent-, teacher-, and self-report scales to assess changes in psychopathic features should specify a time window to use when rating individual items (e.g., the past 12 months).

Another complicating factor that arises when studying changes in psychopathic features is how best to combine information collected from multiple informants, particularly since the concordance across raters tends to be relatively low (Barry, Barry, Deming, & Lochman, 2008; Barry et al., 2007; Frick et al., 2000). Although this issue has been discussed to some extent in the literature, it remains unclear at this time which informants are best-suited to assessing psychopathic features at different points across development (Frick & Moffitt, 2010).

#### Etiological Factors Underlying Psychopathic Features

Developmental studies have examined a wide variety of potential biological and environmental causal factors that may underlie the early emergence and persistence of psychopathic features. For example, evidence from twin studies indicates that the co-occurrence between psychopathic features and conduct problems is strongly influenced by genetic factors (Waldman, Rhee, LoParo, & Park, Chapter 14, this volume), and neuroimaging studies have shown that youth who exhibit conduct problems with accompanying psychopathic traits display a broad range of social and affective processing deficits, including impairments in aversive conditioning, reversal learning, and affective moral reasoning, and reduced responsivity to cues of distress in others (Blair, 2010; Herpers, Scheepers, Bons, Buitelaar, & Rommelse, 2014). However, there is no compelling longitudinal evidence indicating that these neurobiological abnormalities help delineate youth at risk for exhibiting persistent psychopathic features-and some empirical work in fact indicates that the development of CU traits can be influenced by distinct environmental factors, particularly a lack of parental warmth and affection. For example, several studies have indicated that children raised by parents who exhibit low levels of affection, warmth, and positive reinforcement are at increased risk for developing CU traits (Pardini, Lochman, & Powell, 2007; Pasalich, Witkiewitz, McMahon, Pinderhughes, & Conduct Problems Prevention Research Group, 2016). Reciprocal to this, there is evidence that high levels of parental warmth may buffer children with high CU traits from developing serious and persistent conduct problems (Kroneman, Hipwell, Loeber, Koot, & Pardini, 2011; Pasalich, Dadds, Hawes, & Brennan, 2011; Waller, Gardner, & Hyde, 2013).

Despite recent advances, several issues pertaining to the etiology and developmental course of psychopathic features in youth remain unaddressed. First, few longitudinal studies have examined unique versus common factors associated with development of distinct features of psychopathy (and conduct problems more generally) over time. Second, it is unclear whether there are developmental shifts in the biological and environmental factors underlying changes in psychopathic features from childhood to adolescence. This latter issue is particularly important in view of evidence indicating that a significant portion of youth do not begin exhibiting psychopathic features until late childhood or early adolescence (Fontaine, McCrory, Boivin, Moffitt, & Viding, 2011). There are also few longitudinal studies that have used within-individual change models (van de Pol & Verhulst, 2006) to examine whether fluctuations in sociocontextual factors (e.g., abuse/trauma) are associated with changes in psychopathic features during childhood and adolescence. These types of studies are particularly useful for delineating modifiable risk factors that can be targeted by interventions designed for youth exhibiting psychopathic features.

#### Clinical Interventions for Youth with Psychopathic Features

A topic that remains particularly contentious is whether existing empirically supported treatments for early conduct problems are less effective for youth with elevated psychopathic features, particular those high in CU traits. Studies examining this issue have been mixed, with some suggesting that clinic-referred children with high CU traits who receive multicomponent, empirically based interventions (e.g., parent management training, problem-solving skills training, medication management) exhibit significant and sustained reductions in conduct problems from pre- to posttreatment, and others suggesting that children with high CU traits are less responsive to traditional treatment approaches (Hawes, Price, & Dadds, 2014). However, a majority of these studies have examined CU traits as a predictor of treatment outcomes rather than as a moderator of treatment effectiveness. Moreover, multiple studies have indicated that children with conduct problems whose families undergo parent management training (Hawes & Dadds, 2007; McDonald, Dodson, Rosenfield, & Jouriles, 2011; Somech & Elizur, 2012) or more comprehensive multimodal treatments (Kolko et al., 2009; Lochman et al., 2014; Pasalich et al., 2016) show sustained posttreatment reductions in psychopathic features (including CU traits).

Overall, these studies promote optimism regarding the possibility of effectively treating the severe conduct problems exhibited by children and adolescents with psychopathic features. However, not all intervention programs or treatment modalities will be beneficial for these youth, and many such individuals will continue to exhibit clinically significant behavioral impairments following treatment. If interventions can be better tailored to children with psychopathic traits based on the developmental mechanisms underlying their conduct problems, more pronounced and sustained treatment effects will likely be achieved. Toward this end, some initial evidence suggests that teaching and reinforcing use of emotion recognition and affective perspective-taking skills may help to enhance the effectiveness of treatments for children with high CU features (Dadds, Cauchi, Wimalaweera, Hawes, & Brennan, 2012; Kimonis, Bagner, Linares, Blake, & Rodriguez, 2014). Similarly, parent management training programs that place a greater emphasis on skills that help to foster a warm and supportive parent-child relationship (e.g., labeled praise, displays of affection, positive reinforcement) may be particularly effective at reducing CU traits in children (Kimonis et al., 2014; Pasalich et al., 2016). In the coming years, continued developmental research aimed at uncovering the unique etiological factors underlying psychopathic features in youth can be expected to contribute to further innovations that enhance treatment effectiveness.

#### The New "Limited Prosocial Emotions" Specifier for CD

A significant recent advance in the field, noted earlier, has been the incorporation of the "CU traits" construct from the youth psychopathy literature into DSM-5 in the form of a specifier for CD. The specifier encompasses four core symptoms that have consistently been used to delineate CU features in youth, namely, absence of remorse or guilt; a lack of empathy; unconcern about performance; and weak or shallow emotion. To meet criteria for the specifier, youth with CD must exhibit two of these four symptoms for at least 12 months and in more than one relationship or setting. The use of this specific symptom threshold was supported by analyses indicating that it consistently identified in community and clinic samples a subgroup of youth with CD with high levels of aggressive and cruel behaviors (Kahn, Frick, Youngstrom, Findling, & Youngstrom, 2012). However, longitudinal evidence suggests that the use of CU traits as a categorical subtyping scheme for CD may actually reduce the prognostic clinical utility of the underlying dimensional construct (McMahon, Witkiewitz, Kotler, & Conduct Problems Prevention Research Group, 2010; Pardini, Stepp, Hipwell, Stouthamer-Loeber, & Loeber, 2012).

The adoption of the LPE specifier has generated significant debate regarding how best to measure CU symptoms in youth. The Inventory of Callous-Unemotional Traits (ICU; Frick, 2003; Viding & Kimonis, Chapter 7, this volume) was developed in an attempt to assess more comprehensively this configuration of symptoms. Studies evaluating the psychometric properties of this instrument have consistently indicated that most items used to assess "deficient and shallow affect" are not valid indicators of the CU construct, potentially because they refer to hiding emotions rather than having blunted emotional reactivity (Hawes, Byrd, et al., 2014; Kimonis et al., 2008). This evidence has reignited a long-standing debate about the meaning of unemotionality as it relates to psychopathy, and whether it should be considered a core feature of the disorder. There is ample evidence that youth with conduct problems who are high in CU traits tend to exhibit excessive anger and variable levels of anxiety problems (Frick, Ray, Thornton, & Kahn, 2014b; Hawes, Byrd, et al., 2014; Pardini et al., 2012), contrary to the common belief that these youth are devoid of emotional expression. It is possible that CU traits in youth are best characterized by deficiencies in a subset of negative emotions (e.g., empathic sadness, fear in the face of danger, anxiety when being punished). There is also some suggestion that features of low anxiety and fearlessness (i.e., characteristics associated with the boldness construct of the triarchic model; Patrick et al., 2009) may help to further delineate an etiologically distinct subgroup of youth high on psychopathic traits (Kimonis, Frick, Cauffman, Goldweber, & Skeem, 2012). In any case, it remains unclear at this time how best to measure the unemotionality symptom of the new LPE specifier, and this represents an important topic for ongoing research.

#### Neuroimaging Research on Psychopathy: Current Status and Future Prospects

#### Strengths and Limitations of Neuroimaging Methods

The study of psychopathy has been facilitated by the advent of noninvasive methods for measuring brain activity, particularly magnetic resonance imaging (MRI) methodologies such as functional MRI (fMRI). Assuming that dysfunction within particular brain structures or networks is the proximal cause of psychopathy, fMRI data can move researchers closer to understanding what causes individuals with psychopathic features to think and behave as they do. Unlike measures of peripheral physiology such as cardiac, electrodermal, or electromyographic (EMG) response, fMRI provides a window into proximal brain mechanisms underlying characteristic patterns of cognition and behavior in psychopathic individuals. fMRI is the only noninvasive method that can be used to precisely measure activity in specific cortical and subcortical structures thought to be critical to psychopathy, such as the orbitofrontal cortex, striatum, and amygdala. And because fMRI, like other physiological response measures, provides researchers with an alternative to report-based assessment of psychological processes, it can be particularly useful for studying highly psychopathic individuals, who are notorious for employing deception and impression management strategies.

Along with these notable strengths, fMRI methodology also has well-documented limitations (Dorjee & Bowers, 2012; Logothetis, 2008; Rorden & Karnath, 2004), including the fact that fMRI measures blood flow, which is only an indirect proxy for neural activity; that it captures global activation changes in larger-size anatomic regions but not in smaller substructures; that the fMRI activation signal is susceptible to measurement artifacts; that the scanning environment is by nature highly artificial and cannot easily be used to measure the social behaviors that are the crux of psychopathic dysfunction; that its use in psychopathy research is fundamentally correlational, such that causal mechanisms cannot be inferred from identified group differences; and that it remains very costly to use, which limits sample sizes, statistical power, and replicability of findings. The importance of this last issue is magnified in psychopathy research because unique barriers to recruiting psychopathic study participants also limit sample sizes.

The limitations of neuroimaging methodology can be appreciated by considering the terms researchers use to characterize the *meaning* of structural and functional MRI results. Brain activity in a given region (as indexed by blood oxygen level– dependent [BOLD] response) is described as being "recruited," and differences in activation or size of regions are interpreted as being "associated with" or "linked to" a particular phenotype, without considering the functional basis of observed associations. The reason is that these neuroimaging measures do not provide information about what structures of interest are actually *doing*, and why they may or may not be recruited, associated, or linked with the target phenotype. To the extent that psychopathic traits reflect differences in the density or activity of subpopulations of receptors for specific neurotransmitters in a small portion of a structure such as the amygdala, or the density, directionality, or coordination of particular white-matter tracts that comprise distributed neural networks, alternative technologies (e.g., recently developed optical stimulation techniques; Thompson, Stoddart, & Jansen, 2014) will be required to map these phenomena adequately within the brain.

#### Issues of Replicability and Practical Application

These caveats aside, the advent of functional neuroimaging has enabled novel tests of long-standing hypotheses about psychopathy, for example, that the low fear responsiveness associated with this disorder results from amygdala dysfunction (Blair, 2005; Patrick, 1994, 2007). This hypothesis is supported by perhaps the most reliable finding in the fMRI literature on psychopathy-that the amygdala is hyporesponsive to fearful facial expressions in implicit emotion processing paradigms. This finding has been observed in at least eight studies to date, conducted by four separate research groups (e.g., Decety, Chen, Harenski, & Kiehl, 2013; Dolan & Fullam, 2009; Jones, Laurens, Herba, Barker, & Viding, 2009; Lozier, Cardinale, Van-Meter, & Marsh, 2014; Marsh et al., 2008; Sebastian et al., 2014; Viding et al., 2012; White et al., 2012). The consistency of this result supports the contention that neuroimaging can reliably identify aberrant patterns of brain activity in psychopathic youth and adults. It is particularly valuable in light of recent calls for improving replicability across fields of science, particularly psychology.

The robustness of this finding stems in part from the fact it emerged from testing of a clear hypothesis predicated on data from multiple sources, including human physiological and behavioral research, studies of patients with brain lesions, and animal neuroscience investigations. Efforts to measure amygdala response to fearful faces in relation to psychopathy were preceded by observations that lesions of the amygdala result in an array of deficits, including impaired recognition of fearful expressions in humans, and impaired aversive conditioning in both humans and animals deficits that map clearly onto the suite of impairments observed in psychopathy (Blair, 2005). This triangulation approach tends to produce the most effective theoretical models, and fMRI researchers would do well, going forward, to construct hypotheses that are based on evidence derived from the use of various methodologies. Indeed, the previously noted weaknesses of fMRI are best compensated for by the complementary strengths of other methodologies (Rorden & Karnath, 2004).

In addition, efforts should be made to replicate critical findings across research groups and, when results are inconsistent, to identify the sources of that inconsistency. For example, recent efforts by different investigative groups to evaluate how psychopathy affects empathic pain responses have yielded mixed results. Two studies identified hypoactivation in cortical "pain matrix" structures such as the anterior insula and midcingulate cortex (Lockwood et al., 2013; Seara-Cardoso, Sebastian, Viding, & Roiser, 2016), whereas a third reported increased activation in anterior insula (Decety, Skelly, & Kiehl, 2013), and in a fourth study no group differences in either area were detected (Marsh et al., 2013). One explanation for this variability is that instruction-based processing moderates empathic responsiveness in psychopathy. For example, instructions to imagine oneself versus another person in a painful situation (Decety, Skelly, & Kiehl, 2013; Marsh et al., 2013), or deliberately imagine the feelings of another person (Meffert, Gazzola, den Boer, Bartels, & Keysers, 2013), may modulate responsiveness in regions that subserve empathic pain. This intriguing evidence for a moderating effect of instructional set on vicarious pain responding suggests that observed deficits in sensitivity to others' pain in psychopathy may be dependent on processing context, but firm conclusions require corroboration by evidence acquired using other methodologies.

An alternative means for enhancing the robustness of findings is to accrue very large test samples through research consortia such as the European IMAGEN project (Schumann et al., 2010). This large-scale consortium approach provides for increased statistical power and enhanced replicability of findings, and as applied to neuroimaging research, holds promise for advancing knowledge of phenomena such as impulsiveness and reward sensitivity through the joint efforts of multiple investigators using common sampling criteria, diagnostic procedures, and task protocols.

However, there may be some impediments to undertaking similar consortium projects in the field of psychopathy. Perhaps the biggest impediment is recruitment, as clinically psychopathic samples are difficult to recruit and test. Community-based recruitment rarely yields large samples and is notoriously slow and resource-intensive (Richmond, Cheney, Soyfer, Kimmel, & Raine, 2013). Recruitment from forensic or psychiatric institutions can yield larger numbers of participants more quickly, but results in samples that may not be representative of psychopathic individuals within society as a whole (Skeem & Cooke, 2010). The different recruitment approaches in use within the field reflect persistent debates about the construct of psychopathy, and whether it is best understood as primarily a forensic phenomenon that cannot meaningfully be assessed in the community or as a continuously varying dimension, or set of dimensions, that result in criminal behavior only under certain conditions (Skeem, Polaschek, Patrick, & Lilienfeld, 2011). Consortium-based efforts that do not address such issues head-on are unlikely to produce highly informative test samples. The ideal study would recruit from forensic/ correctional, civil psychiatric, and community settings, and employ consistent inclusion criteria and multiple established diagnostic methods across all participants. A study of this type that proved effective in identifying common neurophysiological correlates of psychopathic traits across participants from different settings, as opposed to demonstrating patterns of neural dysfunction only in psychopathic individuals from a particular setting (e.g., correctional institutions), would have the potential to bring resolution to long-standing debates regarding the continuity versus discontinuity of psychopathy as a target for study.

There are some notable advantages in neuroimaging methodology that make it worthwhile to invest resources into consortium projects aimed at investigating brain activation patterns in individuals assessed for psychopathy. One particular advantage is that the dependent variables of interest in neuroimaging studies reside within a concrete, three-dimensional structure whose constituent parts can be localized with precision. This forces all investigators who detect effects at a particular set of coordinates within the brain to compare their findings with prior research examining activation patterns at the same coordinates. As an example, given broad variation in how the construct of "aggression" is defined, findings from different studies of aggressive behavior are often difficult to compare. By contrast, if two investigations of the "amygdala" both find activation increases at coordinates xyz = 20, -7, -26, most researchers would agree that they are measuring the same structure, and that their results can be directly compared. The relative concreteness of the dependent variables in neuroimaging studies may contribute to a more cumulative scientific analysis of psychopathic behavior.

Perhaps the most difficult question regarding the use of neuroimaging in psychopathy pertains to the practical purposes for which neuroimaging findings can-and should-be used. Most current neuroimaging research is directed at identifying neural mechanisms that underlie dysfunctional patterns of cognitive-affective processing (Patrick, Chapter 18, this volume) and behavioral responding in psychopathy. This research is best described as basic rather than translational in nature, although the information it yields may ultimately lead to the development of effective treatments for a disorder that for much of its history has been viewed as untreatable. At the same time, though, efforts are also underway to develop neuroimaging paradigms for use in clinical diagnosis (e.g., Mourão-Miranda et al., 2012; Shimizu et al., 2015) or for guiding treatment decisions (McGrath et al., 2013). Efforts in these directions have intensified over the past decade in part due to the NIMH RDoC initiative, which (as described earlier) encourages a multidomain, biobehavioral approach to conceptualizing, assessing, and treating psychiatric conditions. Although no psychiatric condition can yet be reliably diagnosed at the individual-case level using brain imaging, this may ultimately change.

#### **Ethical Considerations**

Pragmatic issues aside, there are ethical concerns surrounding the use of neuroimaging to diagnose psychopathy that apply less to other forms of psychopathology such as depression or schizophrenia, for which improvements in diagnosis can be expected to facilitate intervention efforts. In the case of psychopathy, effective treatments have not yet been established (though some important progress has been made in this direction; see Polaschek & Skeem, Chapter 29, this volume). From a clinical perspective, therefore, the ethical basis for developing biologically based diagnostic methods is less clear. If developed, such techniques could potentially be co-opted for forensic purposes and as such would undoubtedly affect conviction, sentencing, and parole decisions. For example, research has shown that presenting evidence of biological mechanisms for a psychopathic defendant's behavior leads judges to view the defendant as both less culpable for his crimes and more likely to commit future crimes (Aspinwall, Brown, & Tabery, 2012).

Although no neuroimaging-based measure exists yet for diagnosing psychopathic tendencies or criminal-offense risk, the development of such measures may be close at hand. Recent studies have reported evidence for the utility of structural and functional neuroimaging assessments in prospectively predicting risk of reoffending at the group (i.e., aggregate-correlational) level. For example, in one study of male offenders, Aharoni and colleagues (2014) found that use of fMRI activation scores, together with PCL-R Factor 2 scores, improved prediction of future rearrest outcomes relative to use of Factor 2 scores alone. In a study involving male participants with varing histories of violent behavior, selected from a larger longitudinal-project sample, Pardini, Erickson, Loeber, and Raine (2014) found that reduced amygdala volume at age 26 predicted psychopathic features, particularly affective features, both concurrently and prospectively, as well as at earlier points in life.

Concerns about the ethical implications of applying neuroimaging findings of these types to forensic decision making are understandable. On the other hand, advances in this direction may contribute to the development of new and more effective treatment strategies, which would be beneficial both for individuals receiving clinical services and for the health and safety of society as a whole.

#### Integration: A Proposed Agenda for Ongoing Research in the Field

The foregoing sections by coauthors Wygant, Pardini, and Marsh highlight notable progressions within the field since publication of the first edition of this handbook, and highlight opportunities for refining how we conceptualize and measure psychopathy, and advancing what we know about its causes and developmental course. My aim in this closing section is to propose an agenda for ongoing research in the field that incorporates the perspectives of these authors, along with issues and ideas put forth by various others in this volume. I begin with a broad statement of goals, then follow with some specific suggested directions for investigative work.<sup>1</sup>

#### Broad Goals of Ongoing Research on Psychopathy

Drawing on points made by my coauthors in this chapter, along with the perspectives of other contributors to this volume, the broad goals of continuing research on psychopathy can be stated as follows:

- To characterize the emergence, expression, and temporal course of psychopathic symptomatology, and neuropsychological attributes (or "processes"<sup>2</sup>) related to psychopathic symptomatology, across ages and developmental stages.
- To establish effective prevention and treatment programs informed by knowledge of neuropsychological attributes associated with symptomatology at particular ages.

This statement of goals is explicitly developmental. It recognizes that the measurable symptom features that we recognize as "psychopathic" can arise at varying ages, for differing reasons, and can shift in terms of expression across time within individuals (Fowles, Chapter 5, this volume). Inherent in this view are core developmental science principles of equifinality and multifinality (Cicchetti & Rogosch, 1996).

The principle of equifinality calls for researchers to consider alternative developmental pathways to distinct symptom facets (subdimensions) and particular configurations of these symptom facets within individuals. Operating from this perspective, it can be expected that not all individuals who exhibit a particular set of symptoms will exhibit the same neuropsychological characteristics. This is illustrated, for example, by the finding of different patterns of task-behavioral and neural responding in subgroups of youth exhibiting high levels of conduct problems (e.g., Frick et al., 2003; Viding et al., 2012) and adults attaining high overall scores on the PCL-R (e.g., Newman, Schmitt, & Voss, 1997; Vaidyanathan, Hall, Patrick, & Bernat, 2011). This issue of heterogeneity can be addressed to some extent by examining effects in terms of symptom subdimensions (e.g., presence vs. absence of CU traits in youth with conduct problems; relative levels of Factor 1 and Factor 2 symptoms in adult offenders). However, the principle of equifinality also applies to symptom subdimensions. For example, it has been theorized that CU symptoms can arise due to constitutionally based deficits in affectivity, from repeated adversarial encounters with others, or some combination of the two (Fowles, Chapter 5, this volume; Patrick et al., 2009). Considering this, along with the issue of method variance (Patrick et al., 2013), it can be expected that correlations of this facet of psychopathy (and others) with relevant indicators of neuropsychological function would be modest rather than strong in magnitude (e.g., Brislin et al., 2017; Viding et al., 2012).

The developmental principle of multifinality calls for recognition of the distinction between genotypic (latent) propensity for and phenotypic (manifest) expression of psychopathology. For example, behavioral genetic research on psychopathy (Waldman et al., Chapter 14, this volume) demonstrates that although identical twins exhibit increased similarity for levels of psychopathic features compared to fraternal twins, the concordance they show in absolute terms is moderate rather than high-indicating a substantial contribution of environmental influences (and their interplay with genomic makeup) to the emergence and expression of psychopathic symptoms across time. Moreover, in evaluating the role of neuropsychological characteristics such as executive dysfunction, fearlessness, deficient empathic concern, and weak affiliative capacity in the expression of psychopathic symptomatology, the principle of multifinality requires us to consider that characteristics of these types can progress in alternative phenotypic directions (e.g., more vs. less pathological) as a function of other, co-occurring attributes (dispositions) combined with ongoing experiences across time. For example, executive dysfunction associated with high genotypic liability for externalizing proneness (Krueger et al., 2002; Young et al., 2009; see also Nelson & Foell, Chapter 6, this volume) may be expressed in more versus less psychopathic directions over time as a function of cooccurring affective dispositions (e.g., fearfulness, empathic concern), general intellect, talent (e.g., for music, art, or sports), peer influences, early use of substances, school failure versus success, and so forth.

As a further point, it must also be borne in mind that neuropsychological characteristics such as executive dysfunction, fearlessness, and weak empathic concern, and measurable variations in brain circuitry associated with these characteristics—which tend to be viewed as "mechanisms" for psychopathic symptomatology—are themselves multidetermined and changeable across time and development. Nigg and Casey (2005), for example, theorized that executive (control system) dysfunction emerges due to disruptions in basic neural processing, arising from multiple root sources, which operate over the course of early development to compromise the formation of frontal regulatory networks. From this perspective, variations in cognitive and affective processing as indexed by brain reactivity, other physiological response, or behavioral-task performance are more aptly viewed as correlates or indicators of symptom-related attributes rather than as ultimate mechanisms for psychopathic symptomatology (Miller, 1996; Miller & Rockstroh, 2013).

Given these complexities, how can psychopathy researchers best direct their efforts in order to achieve the broad objectives noted earlier (i.e., to characterize the emergence and progression of psychopathic symptoms and affiliated neuropsychological attributes across time and developmental stages, so as to inform approaches to prevention and treatment at differing points in the life course)? In what follows, I propose some specific, concrete directions that come out of ideas put forth by Wygant, Pardini, and Marsh in the foregoing sections, together with views expressed by authors of other chapters in this volume.

#### **Specific Directions for Future Research**

1. Clarify the course and interplay of callous and disinhibitory facets of psychopathy. Child psychopathy research over the past two decades has highlighted the importance of distinguishing between CU and impulsive-disinhibitory components of psychopathic symptomatology, and over the past decade this distinction has increasingly been recognized and studied in the adult psychopathy literature (i.e., through constructs of coldheartedness, antagonism, or meanness, and externalizing proneness or disinhibition, respectively). As discussed by Pardini in his earlier section, a critical priority for ongoing research is to characterize in a detailed manner the emergence and progression of these distinct symptom subdimensions, and the dynamics of their interplay, across ages and developmental stages. Some key questions of interest include the following:

- At what ages are distinct tendencies toward callousness and impulsive-disinhibitory behavior first evident?
- Is there a "primary" form of callousness that predates but predicts the subsequent emergence of impulsive–disinhibitory behavior, and what temporal stability does it show?

- With what prevalence, and under what conditions (e.g., co-occurring dispositions, environmental influences), does early emerging impulsive-disinhibitory behavior become associated over time with CU symptoms—and what is its corresponding temporal stability?
- Apart from psychopathy, what diagnostic outcomes are associated with callousness that precedes disinhibitory behavior, or with disinhibitory behavior that precedes callous symptomatology?

A major challenge in work of this type is how to integrate findings across studies that use different methods for assessing these symptomatic facets of psychopathy. One means for addressing this challenge is structural equation modeling, which provides a quantitative basis for comparing the extent to which alternative manifest measures operate as effective indicators of target constructs (for an example of such a model, see Drislane & Patrick, 2017); structural models can also be used to evaluate the degree to which lack of strong convergence among alternative operationalizations reflects differences in measurement mode (e.g., clinical interview vs. self-report) as opposed to differences in construct coverage. Beyond this, a further complication in efforts to investigate the course of psychopathic symptomatology across time is that differing modes of measurement are typically used at different ages (i.e., informant ratings with children and younger adolescents, interview and self-report assessments with adults, and assessments of all three types with adolescents). Specialized research strategies will be needed to address this issue-for example, longitudinal studies in which the same participants are tested using (a) informant-based measures during childhood; (b) informant-, interview-, and self-report-based assessments in adolescence; and (c) interview- and self-report-based assessments in adulthood.

In pursuing research on the emergence, progression, and interplay of callous and disinhibitory symptoms, the representations of child and adult psychopathy now provided in DSM-5—within Sections II and III, respectively—can provide a valuable complement to already established inventories such as the interview/file-based PCL-R (and its variants, including youth and abbreviated-screening versions), the informant-based Antisocial Process Screening Device (APSD; Frick & Hare, 2001), and self-report-based inventories including the PPI-R, TriPM, YPI, ICU, and Hare Self-Report Psychopathy scale (SRP; Paulhus, Neumann, & Hare, 2015). As discussed in the section of this chapter by Wygant, self-report-based studies have provided evidence that callous and disinhibitory facets of psychopathy can be effectively operationalized using pathological traits listed in DSM-5 Section III; parallel work can be undertaken to evaluate the validity of interview and informant-rating-based assessments of these Section III traits. As described by Frick and Marsee (Chapter 19, this volume), efforts are also underway to develop optimally effective methods for assessing callousness as represented by the LPE specifier for CD in DSM-5 Section II.

As a complement to this, it would be valuable to have a DSM-based operationalization of childhood disinhibitory symptoms. One approach would be to quantify this symptom facet in terms of the diagnostic criteria for CD specified in DSM-5 Section II. However, a problem with this approach is that the criteria for CD encompass distinct aggressive and nonaggressive subdimensions (Tackett, Krueger, Sawyer, & Graetz, 2003), neither of which corresponds clearly to disinhibition/externalizing proneness in terms of psychological content or external correlates (Burt, 2012). Another problem is that the DSM criteria for CD refer to specific behaviors, many involving delinquent acts, rather than to general proclivities or dispositions. As discussed in point 4 below, there are advantages to operationalizing delinquentantisocial acts separately from psychopathic traits. In revising DSM-5, it would be useful to consider adding a set of trait-oriented criteria for childhood disinhibition (externalizing proneness) to complement the CU (LPE) criteria in Section II, and to interface with the adult concept of disinhibition in Section III.

Because the DSM is used extensively in psychiatric research, DSM-based measures of callousness and disinhibition would create wide opportunities for clarifying influences that contribute to the emergence and continuity of these psychopathy facets across time. Establishing DSM-based measures of these symptom facets will also be important because of the dominant role this official diagnostic nosology plays in the health care system.

2. Clarify relations of dispositional fearlessness with callousness and disinhibition across time. A major unresolved issue of importance in the psychopathy literature is the role that lack of normal fearfulness (i.e., weak defensive reactivity [Patrick et al., 2009] or threat sensitivity [Yancey et al., 2016]) plays in the symptomatic features of psychopathy (see Fowles [Chapter 5], Blair, Meffert, Hwang, & White [Chapter 17], Patrick [Chapter 18], and Frick & Marsee [Chapter 19], this volume). Of note, the concept of deficient fear reactivity has been discussed in relation to both the CU facet of psychopathy (e.g., Frick & Marsee, Chapter 19, this volume) and the facet termed "boldness" in the triarchic model (e.g., see Lilienfeld, Watts, Smith, & Latzman, Chapter 8, and Patrick, Chapter 18, this volume). Some longitudinal evidence exists for an association between fearless tendencies in childhood (assessed via parent report) and the presence of CU symptoms in adolescence, but existing studies of this type (Barker, Oliver, Viding, Salekin, & Maughan, 2011; Byrd, Hawes, Loeber, & Pardini, 2016) have operationalized these constructs in differing ways, and more research of this type is needed. Regarding boldness, most research to date on this construct has been conducted with adults, and it remains unclear at this time how fearless temperament in childhood relates to boldness either in adulthood or adolescence. Additionally, negligible research exists on the association between fearlessness in childhood and clinical symptoms of psychopathy in adulthood (e.g., as assessed by the PCL-R).<sup>3</sup>

To address this issue effectively, a systematic developmental analysis of the construct of fear/ fearlessness, akin to that described earlier for psychopathy facets of callousness and disinhibition, is needed. It is recommended that this construct be operationalized and investigated unto itself, drawing on what is known about its measurement and correlates from research with younger- and adult-age samples (as well as from animal learning and neuroscience studies), and then examined in terms of its interplay with CU and impulsive-disinhibitory symptoms across ages and developmental periods. It is also recommended, in line with issues I discuss in point 3 below, that work of this kind focus on dispositional fear as a multidomain construct-by using variables from nonreport domains (i.e., brain or other physiology; in vivo and lab-task behavior) as manifest indicators, together with report-based measures (i.e., informant or interviewer rating; questionnaire). Research along this line will be critical for clarifying how dispositional fear, conceptualized in neurobehavioral terms (Cuthbert & Kozak, 2013; Patrick, Durbin, & Moser, 2012), relates to the callous and disinhibitory symptoms that have been the major focus of child psychopathy studies-and also to the interpersonal (charming, grandiose, manipulative) symptoms that have been emphasized more in the adult and adolescent literatures, and that link most strongly to the construct of boldness.

3. Clarify how callousness, disinhibition, and fearlessness interface with antisocial behavior across time. Depending on the purposes of assessment, antisocial behavior can be treated either as a symptomindicator of psychopathy or as an expression of broader, more trait-like elements of psychopathy. For example, the PCL-R and its self-report counterpart, the SRP, include antisocial behavior items, along with items assessing interpersonal style, deficient affect, and impulsive-irresponsible (disinhibitory) proclivities. The antisocial behavior items operate as effective indicators of overall psychopathy as indexed by these inventories because they correlate with the interpersonal, affective, and disinhibitory items-and they are valuable for clinical assessment purposes because they contribute importantly to prediction of outcomes such as violent offending and recidivism (Douglas et al., Chapter 28, this volume).

On the other hand, in assessments conducted for purposes of research, it may be advantageous to operationalize psychopathy in trait-oriented terms, without reference to specific antisocial (i.e., delinquent or criminal) acts, and to separately examine how psychopathic traits operationalized in this manner relate to antisocial behavior as an outcome (along with other outcomes such as substance problems, suicidality, school and work failure). This approach is likely to be advantageous, for example, in longitudinal-developmental research that seeks to connect early childhood dispositions to psychopathic proclivities and affiliated outcomes (including criminal offenses and convictions) in later life. It is also likely to be highly beneficial in research directed at identifying neuropsychological attributes related to psychopathic symptomatology, as discussed next.

4. Establish reliable physiological and behavioral indicators of callousness, disinhibition, and fearlessness within and across periods of development. A further goal of ongoing research on psychopathy should be to identify, for participants of differing ages, variables from physiological and behavioral response domains that correlate reliably with report-based assessments of callousness, disinhibition, or fear/fearlessness. As I discussed in Chapter 18 of this volume, and as noted in Marsh's section of the current chapter, variables that have shown promise in this regard include recognition of and brain reactivity to affective (in particular, fearful) face stimuli in the case of callousness, performance on executive control tasks and P3 brain response in the case of disinhibition, and aversive startle potentiation in the case of fear/fearlessness. It will be especially valuable to identify variables of these types that correlate with one or another psychopathy facet across different age periods. Nonreport variables that operate as effective indicators in younger as well as older samples can help to address the problem of method mismatch in report-based assessments of psychopathy across age levels.

Symptom facets of callousness and disinhibition, along with dispositional fear/fearlessness, represent good target phenotypes for research of this type (e.g., as opposed to overall psychopathy, conduct problems, or antisocial behavior) because they have clear neurobehavioral referents. As I discussed in Chapter 18, this volume, callousness relates to neuropsychological constructs including empathic concern, vicarious pain sensitivity, and capacity for affiliation; disinhibition relates to neuropsychological constructs of cognitive control and executive function; and fear-fearlessness relates to neuropsychological constructs of defensive reactivity and affective control. Once multiple nonreport indicators of these target phenotypes have been identified, work can be done to investigate interrelations among known indicators of each. Work of this kind will be valuable for clarifying why, in functional terms, particular variables operate as indicators of a given phenotype, since the psychological meaning of a measured attribute is deduced from the patterns of its associations (convergent and discriminant) with other measured attributes.<sup>4</sup> For example, knowledge of whether and how amygdala reactivity to fearful faces relates to other physiological indicators of callousness (e.g., anterior insula/cingulate reactivity to depictions of others' pain), as well as task-behavioral indicators (e.g., personal pain tolerance), will yield insights into the psychological process tapped by fearful-face reactivity that covaries with callousness.

In turn, as sets of variables are identified that cohere together, these variables can be aggregated to form non-report-based assessments of neuropsychological attributes that relate to the target phenotype (e.g., callousness). Aggregate measures (i.e., tests or scales consisting of multiple items) are advantageous from a psychometric standpoint because they index a target construct more precisely and more reliably. It is conceivable that different neuropsychological attributes, indexed in this manner, will prove to be related to each phenotype. For example, one set of measured variables may index deficient empathic concern as a callousness-related attribute, whereas another set may index weak affiliative motivation. It is also conceivable that some neuropsychological attributes, assessed in this manner, will show greater stability than others in relating to a given target phenotype across periods of development.

To summarize, it should be possible through systematic research efforts to establish non-reportbased aggregate measures of neuropsychological attributes that relate to callousness, disinhibition, and fear/fearlessness as assessed by informant-, clinician-, or self-report; this is a critically important task for the field in which both assessmentoriented researchers and experimental researchers, working with samples of differing types (clinical, nonclinical) and ages (child, adolescent, adult), can contribute. As noted by Wygant in his section of this chapter, this endeavor is consistent with calls from funding agencies for researchers to incorporate non-report-based variables into assessments of health- and performance-related characteristics of individuals. Attributes assessed in this way would be interpretable as neuropsychological elements of psychopathic symptomatology (i.e., biobehavioral characteristics of individuals that account for variance in their clinical presentation). As such, they would provide natural targets for neuropsychologically oriented prevention or intervention programs (e.g., directed at increasing affiliative motivation, cognitive-control capacity, or processing of threat cues).

5. Make use of existing specialized datasets in which distinct facets of psychopathy can be quantified. As discussed by Marsh in her section of this chapter, there are existing large-scale datasets that could be utilized in distinct, targeted ways to help advance the broad aims of psychopathy research as articulated earlier. These include datasets from prospective-longitudinal studies, twin research projects (some of them longitudinal in nature), neuroimaging consortium investigations, and genomic consortium studies. Some studies of particular importance are longitudinal projects that focus on antisocial behavior and include specific measures of psychopathy, with coverage of affective-interpersonal as well as impulsive-externalizing symptoms. Examples include the Pittsburgh Youth Study (Loeber, Farrington, Stouthamer-Loeber, Moffitt, & Caspi, 1998), the Cambridge Study in Delinquent Development (Farrington & Bergstrøm, Chapter 15, this volume), and the Swedish Twin Study of Child and Adolescent Development (TCHAD; Lichtenstein, Tuvblad, Larsson, & Carlstrom, 2007). Others are longitudinal investigations that focus on psychopathology more broadly but include clinical-diagnostic and personality-trait measures from which indices of psychopathy facets can be derived—for example, the Dunedin Multidisciplinary Health and Development Study (Silva, 1990), the Minnesota Twin Family Study (MTFS; Iacono, Carlson, Taylor, Elkins, & McGue, 1999), the Twins Early Development Study (TEDS; Trouton, Spinath, & Plomin, 2002), and the European IMAGEN study (Schumann et al., 2010).

Projects of these types are uniquely valuable because their follow-up designs (in the case of longitudinal studies) or sample composition (in the case of twin studies) allow for causal inferences to be made regarding observed relations between variables of interest. Of further importance (e.g., from the perspective of point 4 above), data from projects of these types include measures from multiple domains of assessment-including informant- or self-report, clinical interview, taskbehavioral, electrophysiological, and in some case neuroimaging measures. A major focus of the multisite IMAGEN project, for example, is on MRI assessment, and available measures include fMRI data from different laboratory tasks (e.g., affective face processing, reward anticipation) along with fMRI resting state, structural MRI, and diffusion tensor imaging data. Neuroimaging data are also available for portions of the MTFS and TEDS twin-sample projects, creating unprecedented opportunities for evaluating causal relations among psychological and neural variables, using both longitudinal and biometric analysis methods. Testing protocols for the IMAGEN, MTFS, and TEDS projects also include collection of genomic (DNAsample) data, providing further avenues for etiological investigation.

To make existing databases of these types maximally useful for advancing our understanding of psychopathy, it will be critically important to establish compatible ("harmonized"; e.g., Doiron et al., 2013) measures of psychopathy symptom facets for participants of differing ages (i.e., early and later childhood, adolescence, adulthood) that allow for comparison and integration of findings across datasets. Substantial efforts have been already been made to develop harmonized measures of psychopathy facets from self-report inventories available in the TCHAD, MTFS, Dunedin,
and IMAGEN projects (Brislin, Drislane, Smith, Edens, & Patrick, 2015; Brislin et al., in press; Drislane et al., 2015; see Drislane & Patrick, 2017, for direct evidence of compatibility) that allow for coordinated analyses of data from older adolescent and adult participants tested in these projects. Further work will need to be undertaken to develop harmonized measures of psychopathy facets for younger participants in these and other datasets, and to establish their compatibility across age periods within particular longitudinal datasets.

# ACKNOWLEDGMENTS

Preparation of this chapter was supported by Grant No. W911NF-14-1-0018 from the U.S. Army. The content of this chapter is solely the responsibility of the authors and does not necessarily represent the official views of the U.S. Government, Department of Defense, Department of the Army, Department of Veterans Affairs, or U.S. Recruiting Command.

## NOTES

- It should be noted that the goals and research directions described in this section apply not just to psychopathy but to other mental disorders as well including clinical conditions such as schizophrenia and major depression, and personality pathologies such as schizotypal, avoidant, and borderline disorders (see, e.g., Patrick & Hajcak, 2016).
- 2. Assessment-oriented researchers think in terms of individual-difference characteristics (attributes), whereas experimental researchers think more in terms of neuropsychological functions ("processes"). However, to the extent that experimentalists seek to relate variations in neuropsychological functioning to psychopathic features, either through group comparisons or continuous-score analyses, they are focusing on processing variations as attributes (i.e., as psychopathy-related characteristics).
- 3. Of note, one study by Piquero and colleagues (2012) used data from the Cambridge Study in Delinquent Development (see Farrington & Bergstrøm, Chapter 15, this volume) to examine the relationship between an "individual risk" index computed from informant ratings of behavior in childhood (ages 8–10) and scores on the PCL-R:SV in middle adulthood (age 48). One variable included in the individual risk index (among a total of 12) was parental ratings of "daring disposition" on the part of the child. Higher scores on the PCL:SV in adulthood—in particular, scores on its Interpersonal and Antisocial facets. The significant association with the Interpersonal facet is of particular interest, as this facet is associ-

ated with both callous unemotionality (meanness) and boldness, in contrast with the PCL's Affective facet, which is related only to callous unemotionality (Venables et al., 2014). However, this study did not evaluate prospective prediction for the "daring disposition" variable specifically, so it is unclear how much this variable contributed to the observed association for the risk index as a whole.

4. It is striking to note that physiological and task-behavioral variables found to correlate with psychopathy diagnoses or symptoms are rarely evaluated for interrelations with one another. For example, research over the years has demonstrated relationships with psychopathy for skin conductance response during aversive anticipation, startle potentiation during aversive cuing, and amygdala reactivity to fearful faces—but no research has examined whether these variables overlap in their associations with psychopathy, or relate separately to it.

## REFERENCES

- Aharoni, E., Vincent, G. M., Harenski, C. L., Calhoun, V. D., Sinnott-Armstrong, W., Gazzaniga, M. S., et al. (2014). Neuroprediction of future arrest. *Proceedings* of the National Academy of Sciences USA, 110(15), 6223–6228.
- American Psychiatric Association. (1952). Diagnostic and statistical manual of mental disorders. Washington, DC: Author.
- American Psychiatric Association. (1968). Diagnostic and statistical manual of mental disorders (2nd ed.). Washington, DC: Author.
- American Psychiatric Association. (1980). Diagnostic and statistical manual of mental disorders (3rd ed.). Washington, DC: Author.
- American Psychiatric Association. (1987). Diagnostic and statistical manual of mental disorders (3rd ed., rev.). Washington, DC: Author.
- American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: Author.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: Author.
- Anderson, J. L., Sellbom, M., Wygant, D. B., Salekin, R. T., & Krueger. R. F. (2014). Examining the associations between DSM-5 Section III antisocial personality disorder traits and psychopathy in community and university samples. *Journal of Personality Disorders*, 28(5), 675–697.
- Aspinwall, L. G., Brown, T. R., & Tabery, J. (2012). The double-edged sword: Does biomechanism increase or decrease judges' sentencing of psychopaths? *Science*, 337, 846–849.
- Barker, E. D., Oliver, B. R., Viding, E., Salekin, R. T., & Maughan, B. (2011). The impact of prenatal maternal risk, fearless temperament and early parenting

on adolescent callous-unemotional traits: A 14-year longitudinal investigation. *Journal of Child Psychology and Psychiatry*, 52, 878–888.

- Barry, T. D., Barry, C. T., Deming, A. M., & Lochman, J. E. (2008). Stability of psychopathic characteristics in childhood: The influence of social relationships. *Criminal Justice and Behavior*, 35(2), 244–262.
- Barry, T. D., Thompson, A., Barry, C. T., Lochman, J. E., Adler, K., & Hill, K. (2007). The importance of narcissism in predicting proactive and reactive aggression in moderately to highly aggressive children. Aggressive Behavior, 33(3), 185–197.
- Benning, S. D., Patrick, C. J., & Iacono, W. G. (2005). Fearlessness and underarousal in psychopathy: Startle blink modulation and electrodermal reactivity in a young adult male community sample. *Psychophysiol*ogy, 42, 753–762.
- Blair, R. J. R. (2005). Applying a cognitive neuroscience perspective to the disorder of psychopathy. *Development and Psychopathology*, 17, 865–891.
- Blair, R. J. R. (2010). Neuroimaging of psychopathy and antisocial behavior: A targeted review. Current Psychiatry Reports, 12(1), 76–82.
- Brennan, L., Shaw, D., Dishion, T., & Wilson, M. (2015). The predictive utility of early childhood disruptive behaviors for school-age social functioning. *Journal of Abnormal Child Psychology*, 43(6), 1187–1199.
- Brislin, S. J., Drislane, L. E., Smith, S. T., Edens, J. F., & Patrick, C. J. (2015). Development and validation of triarchic psychopathy scales from the Multidimensional Personality Questionnaire. *Psychological As*sessment, 27, 838–851.
- Brislin, S. J., Patrick, C. J., Flor, H., Nees, F., Heinrich, A., Drislane, L. E., et al. (in press). Extending the construct network of trait disinhibition to the neuroimaging domain: Validation of a bridging scale for use in the European IMAGEN project. Assessment.
- Brislin, S. J., Yancey, J. R., Perkins, E. R., Palumbo, I. M., Drislane, L. E., Salekin, R. T., et al. (2017). Callousness and affective face processing in adults: Behavioral and brain-potential indicators. *Personality Disorders: Theory, Research, and Treatment.* [Epub ahead of print]
- Burt, S. A. (2012). How do we optimally conceptualize the heterogeneity within antisocial behavior?: An argument for aggressive versus non-aggressive behavioral dimensions. *Clinical Psychology Review*, 32, 263–279.
- Byrd, A. L., Hawes, S. W., Loeber, R., & Pardini, D. A. (2016). Interpersonal callousness from childhood to adolescence: Developmental trajectories and early risk factors. *Journal of Child and Adolescent Psychiatry*. [Epub ahead of print]
- Cicchetti, D., & Rogosch, F. A. (1996). Equifinality and multifinality in developmental psychopathology. *De*velopment and Psychopathology, 8, 597–600.
- Cleckley, H. (1976). *The mask of sanity* (5th ed.). St. Louis, MO: Mosby. (Original work published 1941)
- Colins, O. F., Andershed, H., Frogner, L., Lopez-Rome-

ro, L., Veen, V., & Andershed, A.-K. (2014). A new measure to assess psychopathic personality in children: The Child Problematic Traits Inventory. *Journal of Psychopathology and Behavioral Assessment*, 36(1), 4–21.

- Costa, P. T., Jr., & McCrae, R. R. (1992). Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI): Professional manual. Odessa, FL: Psychological Assessment Resources.
- Crego, C., & Widiger, T. A. (2016). Cleckley's psychopaths: Revisited. Journal of Abnormal Psychology, 125, 75–87.
- Cuthbert, B. N., & Kozak, M. J. (2013). Constructing constructs for psychopathology: The NIMH Research Domain Criteria. *Journal of Abnormal Psychol*ogy, 122, 928–937.
- Dadds, M. R., Cauchi, A. J., Wimalaweera, S., Hawes, D. J., & Brennan, J. (2012). Outcomes, moderators, and mediators of empathic-emotion recognition training for complex conduct problems in childhood. *Psychiatry Research*, 199(3), 201–207.
- Decety, J., Chen, C., Harenski, C., & Kiehl, K. A. (2013). An fMRI study of affective perspective taking in individuals with psychopathy: Imagining another in pain does not evoke empathy. *Frontiers of Human Neuroscience*, 7, Article No. 489.
- Decety, J., Skelly, L. R., & Kiehl, K. A. (2013). Brain response to empathy-eliciting scenarios involving pain in incarcerated individuals with psychopathy. JAMA Psychiatry, 70, 638–645.
- Doiron, D., Burton, P., Marcon, Y., Gaye, A., Wolffenbuttel, B. H. R., Perola, M., et al. (2013). Data harmonization and federated analysis of population-based studies: The BioSHaRE project. *Emerging Themes in Epidemiology*, 10(1), 12.
- Dolan, M. C., & Fullam, R. S. (2009). Psychopathy and functional magnetic resonance imaging blood oxygenation level-dependent responses to emotional faces in violent patients with schizophrenia. *Biological Psychiatry*, 66, 570–577.
- Dorjee, D., & Bowers, J. S. (2012). What can fMRI tell us about the locus of learning? Cortex, 48, 509–514.
- Drislane, L. E., Brislin, S. J., Kendler, K. S., Andershed, H., Larsson, H., & Patrick, C. J. (2015). A triarchic model analysis of the Youth Psychopathic Traits Inventory. *Journal of Personality Disorders*, 29(1), 15–41.
- Drislane, L. E., & Patrick, C. J. (2017). Integrating alternative conceptions of psychopathic personality: A latent variable model of triarchic psychopathy constructs. *Journal of Personality Disorders*, 31, 110–132.
- Drislane, L. E., Patrick, C. J., & Arsal, G. (2014). Clarifying the content coverage of differing psychopathy inventories through reference to the Triarchic Psychopathy Measure. *Psychological Assessment*, 26, 350–362.
- Few, L. R., Lynam, D. R., Maples, J. L., MacKillop, J., & Miller, J. D. (2015). Comparing the utility of DSM-5 Section II and III antisocial personality disorder diagnostic approaches for capturing psychopathic

traits. Personality Disorders: Theory, Research, and Treatment, 6(1), 64–74.

- Few, L. R., Miller, J. D., Rothbaum, A. O., Meller, S., Maples, J., Terry, D. P., et al. (2013). Examination of the Section III DSM-5 diagnostic system for personality disorders in an outpatient clinical sample. *Journal of Abnormal Psychology*, 122, 1057–1069.
- First, M. B., Gibbon, M., Spitzer, R. L., Williams, J. B. W., & Benjamin, L. S. (1997). Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II). Washington, DC: American Psychiatric Press.
- Fontaine, N. M. G., McCrory, E. J. P., Boivin, M., Moffitt, T. E., & Viding, E. (2011). Predictors and outcomes of joint trajectories of callous–unemotional traits and conduct problems in childhood. *Journal of Abnormal Psychology*, 120(3), 730–742.
- Fontaine, N. M. G., Rijsdijk, F. V., McCrory, E. J. P., & Viding, E. (2010). Etiology of different developmental trajectories of callous–unemotional traits. *Journal* of the American Academy of Child and Adolescent Psychiatry, 49(7), 656–664.
- Forth, A., Kosson, D., & Hare, R. (2003). The Hare Psychopathy Checklist: Youth Version, Technical mannual. New York: Multi-Health Systems.
- Frick, P. J. (2003). The Inventory of Callous–Unemotional Traits. Unpublished rating scale, University of New Orleans, New Orleans, LA.
- Frick, P. J., Bodin, S. D., & Barry, C. T. (2000). Psychopathic traits and conduct problems in community and clinic-referred samples of children: Further development of the psychopathy screening device. Psychological Assessment, 12(4), 382–393.
- Frick, P. J., Cornell, A. H., Bodin, S. D., Dane, H. A., Barry, C. T., & Loney, B. R. (2003). Callous–unemotional traits and developmental pathways to severe conduct problems. *Developmental Psychology*, 39, 246–260.
- Frick, P. J., & Hare, R. D. (2001). The Antisocial Process Screening Device (APSD). Toronto: Multi-Health Systems.
- Frick, P. J., & Moffitt, T. E. (2010). A proposal to the DSM-V childhood disorders and the ADHD and disruptive behavior disorders work groups to include a specifier to the diagnosis of conduct disorder based on the presence of callous-unemotional traits. Washington, DC: American Psychiatric Association.
- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014a). Can callous–unemotional traits enhance the understanding, diagnosis, and treatment of serious conduct problems in children and adolescents?: A comprehensive review. *Psychological Bulletin*, 140, 1–57.
- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014b). The road forward for research on callous– unemotional traits: Reply to Lahey (2014). *Psychological Bulletin*, 140(1), 64–68.
- Hare, R. D. (1996). Psychopathy: A clinical construct

whose time has come. *Criminal Justice and Behavior*, 23(1), 25–54.

- Hare, R. D. (2003). The Hare Psychopathy Checklist— Revised (2nd ed.). Toronto: Multi-Health Systems.
- Hare, R. D., Hart, S. D., & Harpur, T. J. (1991). Psychopathy and the DSM-IV criteria for antisocial personality disorder. *Journal of Abnormal Psychology*, 100(3), 391–398.
- Harkness, A. R., Finn, J. A., McNulty, J. L., & Shields, S. M. (2012). The Personality Psychopathology–Five (PSY-5): Recent constructive replication and assessment literature review. *Psychological Assessment*, 24(2), 432–443.
- Hart, S., Cox, D., & Hare, R. D. (1995). Manual for the Psychopathy Checklist: Screening Version (PCL:SV). Toronto: Multi-Health Systems.
- Hawes, D. J., & Dadds, M. R. (2007). Stability and malleability of callous–unemotional traits during treatment for childhood conduct problems. *Journal* of Clinical Child and Adolescent Psychology, 36(3), 347–355.
- Hawes, D. J., Price, M. J., & Dadds, M. R. (2014). Callous–unemotional traits and the treatment of conduct problems in childhood and adolescence: A comprehensive review. *Clinical Child and Family Psychology Review*, 17, 248–267.
- Hawes, S. W., Byrd, A. L., Henderson, C. E., Gazda, R. L., Burke, J. D., Loeber, R., et al. (2014). Refining the parent-reported Inventory of Callous–Unemotional Traits in boys with conduct problems. *Psychological Assessment*, 26(1), 256–266.
- Hawes, S. W., Mulvey, E. P., Schubert, C. A., & Pardini, D. A. (2014). Structural coherence and temporal stability of psychopathic personality features during emerging adulthood. *Journal of Abnormal Psychology*, 123(3), 623–633.
- Herpers, P., Scheepers, F. E., Bons, D., Buitelaar, J. K., & Rommelse, N. N. (2014). The cognitive and neural correlates of psychopathy and especially callous–unemotional traits in youths: A systematic review of the evidence. *Development and Psychopathology*, 26(1), 245–273.
- Hyde, L. W., Shaw, D. S., Gardner, F., Cheong, J., Dishion, T. J., & Wilson, M. (2013). Dimensions of callousness in early childhood: Links to problem behavior and family intervention effectiveness. *Development and Psychopathology*, 25(2), 347–363.
- Iacono, W. G., Carlson, S. R., Taylor, J., Elkins, I. J., & McGue, M. (1999). Behavioral disinhibition and the development of substance use disorders: Findings from the Minnesota Twin Family Study. *Development* and Psychopathology, 11, 869–900.
- Jones, A. P., Laurens, K. R., Herba, C. M., Barker, G. J., & Viding, E. (2009). Amygdala hypoactivity to fearful faces in boys with conduct problems and callous– unemotional traits. *American Journal of Psychiatry*, 166, 95–102.
- Kahn, R. E., Frick, P. J., Youngstrom, E., Findling, R. L.,

& Youngstrom, J. K. (2012). The effects of including a callous–unemotional specifier for the diagnosis of conduct disorder. *Journal of Child Psychology and Psychiatry*, 53(3), 271–282.

- Karpman, B. (1941). On the need of separating psychopathy into two distinct clinical types: The symptomatic and the idiopathic. *Journal of Criminal Psychopathology*, 3, 112–137.
- Kimonis, E. R., Bagner, D. M., Linares, D., Blake, C. A., & Rodriguez, G. (2014). Parent training outcomes among young children with callous–unemotional conduct problems with or at risk for developmental delay. *Journal of Child and Family Studies*, 23(2), 437–448.
- Kimonis, E. R., Frick, P. J., Cauffman, E., Goldweber, A., & Skeem, J. (2012). Primary and secondary variants of juvenile psychopathy differ in emotional processing. *Development and Psychopathology*, 24(3), 1091–1103.
- Kimonis, E. R., Frick, P. J., Skeem, J. L., Marsee, M. A., Cruise, K., Muñoz, L. C., et al. (2008). Assessing callous–unemotional traits in adolescent offenders: Validation of the Inventory of Callous–Unemotional Traits. International Journal of Law and Psychiatry, 31(3), 241–252.
- Klingzell, I., Fanti, K. A., Colins, O. F., Frogner, L., Andershed, A.-K., & Andershed, H. (2016). Early childhood trajectories of conduct problems and callous–unemotional traits: The role of fearlessness and psychopathic personality dimensions. *Child Psychiatry and Human Development*, 47(2), 236–247.
- Kochanska, G., Forman, D. R., Aksan, N., & Dunbar, S. B. (2005). Pathways to conscience: Early mother– child mutually responsive orientation and children's moral emotion, conduct, and cognition. *Journal of Child Psychology and Psychiatry*, 46(1), 19–34.
- Kolko, D. J., Dorn, L. D., Bukstein, O. G., Pardini, D., Holden, E. A., & Hart, J. (2009). Community vs. clinic-based modular treatment of children with early-onset ODD or CD: A clinical trial with 3-year follow-up. Journal of Abnormal Child Psychology, 37(5), 591–609.
- Kroneman, L. M., Hipwell, A. E., Loeber, R., Koot, H. M., & Pardini, D. A. (2011). Contextual risk factors as predictors of disruptive behavior disorder trajectories in girls: The moderating effect of callous–unemotional features. *Journal of Child Psychology and Psychiatry*, 52(2), 167–175.
- Krueger, R. F., Derringer, J., Markon, K. E., Watson, D., & Skodol, A. E. (2012). Initial construction of a maladaptive personality trait model and inventory for DSM-5. Psychological Medicine, 41, 1879–1890.
- Krueger, R. F., Hicks, B., Patrick, C. J., Carlson, S., Iacono, W. G., & McGue, M. (2002). Etiologic connections among substance dependence, antisocial behavior, and personality: Modeling the externalizing spectrum. *Journal of Abnormal Psychology*, 111, 411–424.

- Kwako, L. E., Momenan, R., Litten, R. Z., Koob, G. F., & Goldman, D. (2016). Addictions Neuroclinical Assessment: A neuroscience-based framework for addictive disorders. *Biological Psychiatry*, 80(3), 179–189.
- Lichtenstein, P., Tuvblad, C., Larsson, H., & Carlstrom, E. (2007). The Swedish twin study of CHild and Adolescent Development: The TCHAD-study. Twin Research and Human Genetics, 10(1), 67–73.
- Lilienfeld, S. O., & Landfeld, K. (2008). Issues in diagnosis: Categorical vs. dimensional. In W. E. Craighead, D. J. Miklowitz, & L. W. Craighead (Eds.), *Psychopathology: History, theory, and diagnosis for clinicians* (pp. 1–33). Hoboken, NJ: Wiley.
- Lilienfeld, S. O., & Widows, M. R. (2005). Psychopathic Personality Inventory—Revised (PPI-R) professional manual. Odessa, FL: Psychological Assessment Resources.
- Litten, R. Z., Ryan, M. L., Falk, D. E., Reilly, M., Fertig, J. B., & Koob, G. F. (2015). Heterogeneity of alcohol use disorder: Understanding mechanisms to advance personalized treatment. Alcoholism: Clinical and Experimental Research, 39(4), 579–584.
- Lochman, J. E., Baden, R. E., Boxmeyer, C. L., Powell, N. P., Qu, L., Salekin, K. L., et al. (2014). Does a booster intervention augment the preventive effects of an abbreviated version of the Coping Power Program for aggressive children? *Journal of Abnormal Child Psychology*, 42(3), 367–381.
- Lockwood, P. L., Sebastian, C. L., McCrory, E. J., Hyde, Z. H., Gu, X., De Brito, S. A., et al. (2013). Association of callous traits with reduced neural response to others' pain in children with conduct problems. *Current Biology*, 23, 901–905.
- Loeber, R., Farrington, D. P., Stouthamer-Loeber, M., Moffitt, T. E., & Caspi, A. (1998). The development of male offending: Key findings from the first decade of the Pittsburgh Youth Study. *Studies in Crime and Crime Prevention*, 7, 141–172.
- Loevinger, J. (1957). Objective tests as instruments of psychological theory. Psychological Reports, 3, 635– 694.
- Logothetis, N. K. (2008). What we can do and what we cannot do with fMRI. *Nature*, 453, 869–878.
- Lozier, L. M., Cardinale, E. M., VanMeter, J. W., & Marsh, A. A. (2014). Mediation of the relationship between callous–unemotional traits and proactive aggression by amygdala response to fear among children with conduct problems. JAMA Psychiatry, 71, 627–636.
- Lykken, D. T. (1995). The antisocial personalities. Hillsdale, NJ: Erlbaum.
- Lynam, D. R., Caspi, A., Moffitt, T. E., Loeber, R., & Stouthamer-Loeber, M. (2007). Longitudinal evidence that psychopathy scores in early adolescence predict adult psychopathy. *Journal of Abnormal Psychology*, 116(1), 155–165.
- Lynam, D. R., & Vachon, D. D. (2012). Antisocial personality disorder in DSM-5: Missteps and missed op-

portunities. Personality Disorders: Theory, Research, and Treatment, 3(4), 483–495.

- Marsh, A. A., Finger, E. C., Fowler, K. A., Adalio, C. J., Jurkowitz, I. T., Schechter, J. C., et al. (2013). Empathic responsiveness in amygdala and anterior cingulate cortex in youths with psychopathic traits. *Journal of Child Psychology and Psychiatry*, 54, 900–910.
- Marsh, A. A., Finger, E. C., Mitchell, D. G., Reid, M. E., Sims, C., Kosson, D. S., et al. (2008). Reduced amygdala response to fearful expressions in children and adolescents with callous–unemotional traits and disruptive behavior disorders. *American Journal of Psychiatry*, 165, 712–720.
- McDonald, R., Dodson, M. C., Rosenfield, D., & Jouriles, E. N. (2011). Effects of a parenting intervention on features of psychopathy in children. *Journal of Abnormal Child Psychology*, 39, 1013–1023.
- McGrath, C. L., Kelley, M. E., Holtzheimer, P. E., Dunlop, B. W., Craighead, W. E., Franco, A. R., et al. (2013). Toward a neuroimaging treatment selection biomarker for major depressive disorder. JAMA Psychiatry, 70, 821–829.
- McMahon, R. J., Witkiewitz, K., Kotler, J. S., & Conduct Problems Prevention Research Group. (2010). Predictive validity of callous–unemotional traits measured in early adolescence with respect to multiple antisocial outcomes. *Journal of Abnormal Psychology*, 119(4), 752–763.
- Meffert, H., Gazzola, V., den Boer, J. A., Bartels, A. A., & Keysers, C. (2013). Reduced spontaneous but relatively normal deliberate vicarious representations in psychopathy. *Brain*, 136, 2550–2562.
- Miller, G. A. (1996). How we think about cognition, emotion, and biology in psychopathology. *Psycho*physiology, 21, 257–264.
- Miller, G. A., & Rockstroh, B. (2013). Endophenotypes in psychopathology research: Where do we stand? *Annual Review of Clinical Psychology*, 9, 177–213.
- Morgan, A. B., & Lilienfeld, S. O. (2000). A meta-analytic review of the relation between antisocial behavior and neuropsychological measures of executive function. *Clinical Psychology Review*, 20, 113–136.
- Mourão-Miranda, J., Oliveira, L., Ladouceur, C. D., Marquand, A., Brammer, M., Birmaher, B., et al. (2012). Pattern recognition and functional neuroimaging help to discriminate healthy adolescents at risk for mood disorders from low risk adolescents. PLOS ONE, 7(2), e29482.
- National Research Council, Committee on Measuring Human Capabilities: Performance Potential of Individuals and Collectives, Board on Behavioral, Cognitive, and Sensory Sciences, Division of Behavioral and Social Sciences and Education. (2015). Measuring human capabilities: An agenda for basic research on the assessment of individual and group performance potential for military accession. Washington, DC: National Academies Press.

- Nelson, L. D., Patrick, C. J., & Bernat, E. M. (2011). Operationalizing proneness to externalizing psychopathology as a multivariate psychophysiological phenotype. *Psychophysiology*, 48, 64–72.
- Neumann, C. S., Kosson, D. S., Forth, A. E., & Hare, R. D. (2006). Factor structure of the Hare Psychopathy Checklist: Youth Version (PCL:YV) in incarcerated adolescents. *Psychological Assessment*, 18(2), 142–154.
- Newman, J. P., Schmitt, W. A., & Voss, W. D. (1997). The impact of motivationally neutral cues on psychopathic individuals: Assessing the generality of the response modulation hypothesis. *Journal of Abnormal Psychology*, 106(4), 563–575.
- Nigg, J. T. (2006). Temperament and developmental psychopathology. *Journal of Child Psychology and Psychiatry*, 47(3–4), 395–422.
- Nigg, J. T., & Casey, B. J. (2005). An integrative theory of attention-deficit/hyperactivity disorder based on the cognitive and affective neurosciences. *Developmental Psychopathology*, 17, 785–806.
- Obradović, J., Pardini, D. A., Long, J. D., & Loeber, R. (2007). Measuring interpersonal callousness in boys from childhood to adolescence: An examination of longitudinal invariance and temporal stability. *Journal of Clinical Child and Adolescent Psychology*, 36(3), 276–292.
- Pardini, D. A., & Byrd, A. L. (2013). Developmental conceptualizations of psychopathic features. In K. A. Kiehl & W. Sinnott-Armstrong (Eds.), *Handbook on psychopathy and law* (pp. 61–77). Oxford, UK: Oxford University Press.
- Pardini, D. A., Erickson, K., Loeber, R., & Raine, A. (2014). Lower amygdala volume in men is associated with childhood aggression, early psychopathic traits, and future violence. *Biological Psychiatry*, 75, 73–80.
- Pardini, D. A., Lochman, J. E., & Powell, N. (2007). The development of callous–unemotional traits and antisocial behavior in children: Are there shared and/or unique predictors? *Journal of Clinical Child and Adolescent Psychology*, 36(3), 319–333.
- Pardini, D. A., Stepp, S., Hipwell, A., Stouthamer-Loeber, M., & Loeber, R. (2012). The clinical utility of the proposed DSM-5 callous–unemotional subtype of conduct disorder in young girls. *Journal of the American Academy of Child and Adolescent Psychiatry*, 51, 62–73.
- Pasalich, D. S., Dadds, M. R., Hawes, D. J., & Brennan, J. (2011). Do callous–unemotional traits moderate the relative importance of parental coercion versus warmth in child conduct problems?: An observational study. Journal of Child Psychology and Psychiatry, 52(11), 1308–1315.
- Pasalich, D. S., Witkiewitz, K., McMahon, R. J., Pinderhughes, E. E., & Conduct Problems Prevention Research Group. (2016). Indirect effects of the Fast Track intervention on conduct disorder symptoms and callous–unemotional traits: Distinct pathways

involving discipline and warmth. Journal of Abnormal Child Psychology, 44(3), 587–597.

- Patrick, C. J. (1994). Emotion and psychopathy: Startling new insights. Psychophysiology, 31, 319–330.
- Patrick, C. J. (2007). Getting to the heart of psychopathy. In H. Hervé & J. C. Yuille (Eds.), The psychopath: Theory, research, and practice (pp. 207–252). Hillsdale, NI: Erlbaum.
- Patrick, C. J., & Drislane, L. E. (2015a). Antisocial personality disorder and psychopathy. In P. H. Blaney, R. F. Krueger, & T. Millon (Eds.), Oxford textbook of psychopathology (3rd ed., pp. 681–706). New York: Oxford University Press.
- Patrick, C. J., & Drislane, L. E. (2015b). Triarchic model of psychopathy: Origins, operationalizations, and observed linkages with personality and general psychopathology. *Journal of Personality*, 83, 627–643.
- Patrick, C. J., Durbin, C. E., & Moser, J. S. (2012). Conceptualizing proneness to antisocial deviance in neurobehavioral terms. *Development and Psychopathol*ogy, 24, 1047–1071.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. Development and Psychopathology, 21, 913–938.
- Patrick, C. J., & Hajcak, G. (2016). RDoC: Translating promise into progress. Psychophysiology, 53, 415–424.
- Patrick, C. J., Venables, N. C., Yancey, J. R., Hicks, B. M., Nelson, L. D., & Kramer, M. D. (2013). A construct-network approach to bridging diagnostic and physiological domains: Application to assessment of externalizing psychopathology. *Journal of Abnormal Psychology*, 122, 902–916.
- Paulhus, D. L., Neumann, C. S., & Hare, R. D. (2015). Manual for the Self-Report Psychopathy Scale (4th ed.). Toronto: Multi-Health Systems.
- Piquero, A. R., Farrington, D. P., Fontaine, N., Vincent, G., Coid, J., & Ullrich, S. (2012). Childhood risk, offending trajectories, and psychopathy at age 48 years in the Cambridge Study in Delinquent Development. Psychology, Public Policy, and Law 18, 577–598.
- Richmond, T. S., Cheney, R., Soyfer, L., Kimmel, R., & Raine, A. (2013). Recruiting of community-residing youth into studies on aggression. *Journal of Commu*nity Psychology, 41, 425–434.
- Rorden, C., & Karnath, H. O. (2004). Using human brain lesions to infer function: A relic from a past era in the fMRI age. *Nature Reviews Neuroscience*, 5, 813–819.
- Schumann, G., Loth, E., Banaschewski, T., Barbot, A., Barker, G., Büchel, C., et al. (2010). The IMAGEN study: Reinforcement-related behaviour in normal brain function and psychopathology. *Molecular Psychiatry*, 15, 1128–1139.
- Seara-Cardoso, A., Sebastian, C. L., Viding, E., & Roiser, J. P. (2016). Affective resonance in response to others' emotional faces varies with affective ratings and psychopathic traits in amygdala and anterior insula. Social Neuroscience, 11, 140–152.

- Sebastian, C. L., McCrory, E. J., Dadds, M. R., Cecil, C. A., Lockwood, P. L., Hyde, Z. H., et al. (2014). Neural responses to fearful eyes in children with conduct problems and varying levels of callous–unemotional traits. *Psychological Medicine*, 44, 99–109.
- Shimizu, Y., Yoshimoto, J., Toki, S., Takamura, M., Yoshimura, S., Okamoto, Y., et al. (2015). Toward probabilistic diagnosis and understanding of depression based on functional MRI data analysis with Logistic Group LASSO. PLOS ONE, 10(5), e0123524.
- Silva, P. A. (1990). The Dunedin Multidisciplinary Health and Development Study: A fifteen year longitudinal study. *Paediatric and Perinatal Epidemiology*, 4, 96–127.
- Skeem, J. L., & Cooke, D. J. (2010). Is criminal behavior a central component of psychopathy?: Conceptual directions for resolving the debate. *Psychological As*sessment, 22, 433–445.
- Skeem, J. L., Polaschek, D. L. L., Patrick, C. J., & Lilienfeld, S. O. (2011). Psychopathic personality: Bridging the gap between scientific evidence and public policy. *Psychological Science in the Public Interest*, 12, 95–162.
- Sleep, C. E., Wygant, D. B., & Miller, J. D. (2017). Examining the incremental utility of DSM-5 Section III traits and impairment in relation to traditional personality disorder scores in a female correctional sample. *Journal of Personality Disorders*. [Epub ahead of print]
- Somech, L. Y., & Elizur, Y. (2012). Promoting self-regulation and cooperation in pre-kindergarten children with conduct problems: A randomized controlled trial. Journal of the American Academy of Child and Adolescent Psychiatry, 51(4), 412–422.
- Strickland, C. M., Drislane, L. E., Lucy, M. D., Krueger, R. F., & Patrick, C. J. (2013). Characterizing psychopathy using DSM-5 personality traits. Assessment, 20, 327–338.
- Tackett, J. L., Krueger, R. F., Sawyer, M. G., & Graetz, B. W. (2003). Subfactors of DSM-IV conduct disorder: Evidence and connections with syndromes from the Child Behavior Checklist. *Journal of Abnormal Child Psychology*, 31, 647–654.
- Talwar, V., Gordon, H. M., & Lee, K. (2007). Lying in the elementary school years: Verbal deception and its relation to second-order belief understanding. *Devel*opmental Psychology, 43(3), 804–810.
- Talwar, V., & Lee, K. (2002). Development of lying to conceal a transgression: Children's control of expressive behavior during verbal deception. International Journal of Behavioral Development, 26(5), 436–444.
- Talwar, V., Lee, K., Bala, N., & Lindsay, R. C. L. (2002). Children's conceptual knowledge of lying and its relation to their actual behaviors: Implications for court competence examinations. Law and Human Behavior, 26(4), 395–415.
- Thomaes, S., Brummelman, E., Reijntjes, A., & Bush-

man, B. J. (2013). When Narcissus was a boy: Origins, nature, and consequences of childhood narcissism. *Child Development Perspectives*, 7(1), 22–26.

- Thompson, A. C., Stoddart, P. R., & Jansen, E. D. (2014). Optical stimulation of neurons. Current Molecular Imaging, 3, 162–177.
- Trouton, A., Spinath, F. M., & Plomin, R. (2002). Twins Early Development Study (TEDS): A multivariate, longitudinal genetic investigation of language, cognition and behavior problems in childhood. *Twin Research*, 5, 444–448.
- Vaidyanathan, U., Hall, J. R., Patrick, C. J., & Bernat, E. M. (2011). Clarifying the role of defensive reactivity deficits in psychopathy and antisocial personality using startle reflex methodology. *Journal of Abnormal Psychology*, 120, 253–258.
- van de Pol, M. & Verhulst, S. (2006). Age-dependent traits: A new statistical model to separate withinand between-individual effects. American Naturalist, 167(5), 766–773.
- Venables, N. C., Hall, J. R., & Patrick, C. J. (2014). Differentiating psychopathy from antisocial personality disorder: A Triarchic model perspective. *Psychological Medicine*, 44, 1005–1013.
- Viding, E., Sebastian, C. L., Dadds, M. R., Lockwood, P. L., Cecil, C. A., De Brito, S. A., et al. (2012). Amygdala response to preattentive masked fear in children with conduct problems: The role of callous–unemotional traits. American Journal of Psychiatry, 169, 1109–1116.
- Wall, T. D., Wygant, D. B., & Sellbom, M. (2015). Boldness explains a key difference between psychopathy and antisocial personality disorder. *Psychiatry*, *Psychology and Law*, 22, 94–105.
- Waller, R., Gardner, F., & Hyde, L. W. (2013). What are the associations between parenting, callous–unemotional traits, and antisocial behavior in youth?: A systematic review of evidence. *Clinical Psychology Review*, 33, 593–608.

- Waller, R., Gardner, F., Viding, E., Shaw, D. S., Dishion, T. J., Wilson, M. N., et al. (2014). Bidirectional associations between parental warmth, callous unemotional behavior, and behavior problems in high-risk preschoolers. Journal of Abnormal Child Psychology, 42(8), 1275–1285.
- White, S. F., Marsh, A. A., Fowler, K. A., Schechter, J. C., Adalio, C., Pope, K., et al. (2012). Reduced amygdala response in youths with disruptive behavior disorders and psychopathic traits: Decreased emotional response versus increased top-down attention to nonemotional features. American Journal of Psychiatry, 169, 750–758.
- Wygant, D. B., & Sellbom, M. (2012). Viewing psychopathy from the perspective of the Personality Psychopathology Five Model: Implications for DSM-5. *Journal of Personality Disorders*, 26, 717–726.
- Wygant, D. B., Sellbom, M., Sleep, C. E., Wall, T. D., Applegate, K. C., Krueger, R. F., et al. (2016). Examining the DSM-5 alternative personality disorder model operationalization of antisocial personality disorder and psychopathy in a male correctional sample. Personality Disorders: Theory, Research, and Treatment, 7, 229–239.
- Yancey, J. R., Venables, N. C., & Patrick, C. J. (2016). Psychoneurometric operationalization of threat sensitivity: Relations with clinical symptom and physiological response criteria. *Psychophysiology*, 53, 393–405.
- Young, S. E., Friedman, N. P., Miyake, A., Willcutt, E. G., Corley, R. P., Haberstick, B. C., et al. (2009). Behavioral disinhibition: liability for externalizing spectrum disorders and its genetic and environmental relation to response inhibition across adolescence. *Journal of Abnormal Psychology*, 118, 117–130.
- Zahn-Waxler, C., & Kochanska, G. (1990). The origins of guilt. In R. Thompson (Ed.), Nebraska Symposium on Motivation (Vol. 36, pp. 183–258). Lincoln: University of Nebraska Press.

# Author Index

Abad, F. J., 536 Abbey, A., 612, 669, 670 Abikoff, H., 460 Abracen, J., 695, 713 Abram, K. M., 515 Abram, S. V., 137 Abramowitz, C., 59, 314, 321, 535, 537, 551, 639 Abu, Z., 150, 343 Abu-Akel, A., 626 Abushua'leh, K., 626 Accili, D., 341 Achenbach, T. M., 7, 8, 128, 134, 156, 289, 336, 488, 644 Acker, M., 668 Ackley, C. N., 194, 198 Adams, G., 530 Adams, H. E., 664 Adams, R., 386, 484 Adleman, N. E., 645 Adolphs, R., 403, 405, 406, 443 Aerts, E., 484 af Klinteberg, B., 363, 368, 540, 542, 551 Agar, A., 625 Ageton, S. S., 669 Aggen, S. H., 340, 641 Agrawal, A., 646 Ahadi, S. A., 95, 97, 99, 465 Aharoni, E., 587, 613, 766 Ahmetoglu, G., 594 Ajo Arnevik, E., 638 Akhtar, R., 594 Akin, M., 596 Akitsuki, Y., 406, 440 Aksan, N., 114, 169, 760 Albert, R. S., 167 Alders, G. L., 384, 724 Alegria, A. A., 638 Alessandri, G., 483

Alexander, J. F., 371 Alexander, W. H., 413 Ali, F., 589 Allain, A. N., 593 Allen, A. D., 496, 724 Allen, J. J., 136, 646 Allen, J. L., 151, 153, 595 Allen, L. C., 550, 639 Alliger, G. M., 213 Allik, J., 263 Allis, C. D., 95 Allport, G. W., 59, 211, 259 Alm, P.-O., 363, 542 Alperin, B. R., 86 Alterman, A. I., 512, 515, 648, 715 Altman, H., 219 Alvarenga, M. A. S., 536 Amen, D. G., 383 Ames, M. A., 363 Amil, O., 596 Amos, N. L., 612, 619, 673 Anastassiou-Hadjicharalambous, X., 152, 155, 405, 493, 494, 546, 554 Anckarsäter, H., 695 Anders, S., 594 Andersen, H. S., 538, 544, 551, 552 Andershed, A.-K., 480 Andershed, H., 9, 50, 52, 64, 68, 102, 132, 146, 147, 148, 149, 172, 220, 246, 266, 270, 274, 312, 313, 320, 324, 338, 339, 355, 382, 423, 425, 435, 445, 479, 480, 482, 486, 488, 489, 491, 510, 514, 518, 538, 539, 540, 547, 551, 595, 623, 640, 646, 693, 701, 718, 741, 757 Anderson, C. A., 613, 614 Anderson, I. M., 383, 518 Anderson, J. L., 45, 53, 54, 134, 170, 172, 212, 221, 224, 236, 238, 239, 758, 759 Anderson, L. M., 128

Anderson, N. E., 80, 401, 402, 433, 520 Anderson, S. W., 390, 518 Anderson, W. P., 665 Andrade, B. F., 492 Andreason, P. J., 381 Andrews, B. P., 9, 34, 100, 131, 147, 167, 177, 200, 215, 216, 217, 232, 266, 291, 301, 302, 338, 423, 480, 510, 512, 535, 589, 615, 641, 663, 742 Andrews, D., 56 Andrews, D. A., 683, 699, 711, 712, 713, 741 Ang, R. P., 484 Angleitner, A., 216 Angold, A., 156, 485 Aniskiewicz, A. S., 405, 406 Anney, R. J., 344 Ansel, L. L., 539, 540 Ansell, E. B., 287 Anthony, C., 689, 740 Antolin, T., 648 Anton, M. E., 390, 520 Aparicio, M., IV, 88 Applegate, B., 462 Arbisi, P. A., 11, 134, 215, 325 Arboleda-Florez, J., 532, 545 Arias, A., 648 Arieti, S., 40, 64, 200 Armenakis, A. A., 594, 613 Armentrout, J. A., 665 Armstrong, K. A., 156 Arnell, K. M., 85 Arnett, J. J., 643 Arnett, P. A., 84, 617 Arnsten, A. F. T., 644 Arntz, A., 146, 468, 551 Arrigo, B. A., 80, 574 Arsal, G., 8, 132, 147, 172, 291, 298, 315, 423, 538, 589, 598, 615, 742, 758

# 780

Asendorpf, J. B., 465 Ashton, M. C., 179, 202, 245, 670 Asnaani, A., 648 Aspinwall, L. G., 734, 766 Aspland, H., 371 Assary, E., 483 Asscher, J. J., 372, 487, 496, 690, 691, 692, 693, 694, 720, 741 Atkins, M. S., 613 Atkinson, G., 593 Atkinson, R., 716 Attard, S., 54 Attrill, G., 195 Aucoin, K. J., 151, 155, 458, 625 Audenaert, K., 614 Auty, K., 357 Auty, K. M., 366 Auvinen-Lintunen, L., 152 Ayame, T., 85 Ayduk, O., 98, 99, 106 Aykes, K., 109 Avnesworth, H., 578 Baas, J. M., 434 Babchishin, K. M., 57, 667 Babiak, P., 59, 62, 68, 69, 287, 585, 588, 589, 596, 612, 613 Babinski, L. M., 461 Babor, T. F., 636, 643 Baca-Garcia, E., 342 Bachner-Melman, R., 343 Bagby, R. M., 216, 513 Bagner, D. M., 146, 763 Bagshaw, R., 593 Bagwell, C., 386, 484 Bailer-Jones, D., 86 Bailey, C. D., 594 Baird, A. A., 234, 435 Baker, L. A., 104, 149, 339, 393, 554, 595, 646 Bala, N., 760 Baldridge, R. M., 616 Baler, R. D., 644 Ball, S. A., 53 Balleine, B. W., 410, 412 Bandstra, N. F., 484 Bandura, A., 613 Banich, M. T., 413 Banks, G. C., 263, 596 Banquet, J. P., 88 Banys, P., 515 Barbaranelli, C., 483 Barbaree, H. E., 553, 619, 664, 673, 688, 713, 715 Barbosa, F., 431 Barchard, K., 616, 697 Bare, R., 594 Barese, T. H., 625 Barkataki, I., 385 Barker, E. D., 153, 154, 156, 482, 483, 484, 485, 490, 491, 497, 550, 595, 769 Barker, G., 541 Barker, G. J., 405, 438, 494, 764 Barkley, R. A., 106, 134 Barkow, J. H., 180 Barlow, D. H., 97, 536 Barnes, G., 366, 668 Barnes, J. C., 341, 648

# Author Index

Barratt, E. S., 614 Barrett, K. C., 485 Barrett, L. F., 428 Barrick, M. R., 262 Barroso, R., 538 Barry, C. T., 145, 148, 150, 153, 368, 458, 462, 463, 465, 467, 482, 484, 490, 493, 497, 539, 540, 555, 624, 720, 760, 761 Barry, R. A., 484 Barry, T. D., 368, 484, 490, 761 Bartel, P., 683 Bartels, A. A., 85, 407, 440, 765 Bartholow, B. D., 644 Bartol, A. M., 572 Bartol, C. R., 572 Barton, C., 371 Baruch, G., 720 Baskin-Sommers, A. R., 51, 54, 61, 83, 84, 85, 86, 87, 88, 89, 90, 390, 407, 433, 434, 520, 521, 671, 716, 726 Bass, D., 371 Bates, A. T., 645 Bates, J. E., 99, 106, 370, 410, 458, 465 Bates, M. E., 649 Battin-Pearson, S., 368, 700 Bau, C. H. D., 647 Bauer, D., 721 Bauer, D. L., 550, 640 Bauer, L. O., 645 Baughman, H. M., 670 Baumeister, R. F., 484 Baxter, C., 650 Baysinger, M. A., 612, 670 Beach, S. R. H., 647, 648 Beadnell, B., 669 Beauchaine, T. P., 95, 108, 109, 426, 444, 647 Beaver, K. M., 147, 341, 519, 647 Bechara, A., 388, 390, 427, 518, 645 Beck, A., 27 Becker, J. V., 621, 673, 696 Beckett, G. E., 595 Beech, A. R., 718 Beer, J. S., 276 Beggs, S. M., 595, 696 Begleiter, H., 645 Beitchman, J. H., 150, 342, 343, 495 Belacchi, C., 485 Belfort, J., 590 Belfrage, H., 46, 511, 512, 542, 626, 683, 691, 741 Belmore, M. F., 587, 593 Ben-Abdallah, A., 638 Benbouriche, M., 667 Bencic, R. K., 88 Bender, D. S., 284, 285 Bender, T. W., 519 Benet-Martinez, V., 286 Benjamin, L. S., 356, 669, 758 Benning, S. D., 9, 11, 12, 13, 14, 16, 34, 39, 95, 100, 101, 130, 147, 166, 167, 168, 171, 174, 178, 219, 231, 232, 245, 246, 249, 269, 270, 286, 292, 298, 302, 303, 346, 388, 423, 424, 426, 429, 433, 442, 445, 513, 585, 587, 588, 589, 593, 596, 597, 598, 613, 615, 616, 635, 640, 641, 643, 671, 760 Bennis-Taleb, N., 393

Ben-Porath, Y. S., 212, 215, 216, 220, 234, 593, 670, 688 Benson, D. F., 390, 427 Benton, D., 518 Berardino, S. D., 512 Berg, J. L., 287 Berg, J. M., 166, 172, 175, 180, 263, 482, 593, 614 Berger, J., 197 Bergman, H., 343 Bergman, R., 165 Bergstrøm, H., 45, 354, 366, 368, 425, 756, 771, 772 Berkowitz, L., 411, 458, 613 Berman, A. H., 639 Berman, I., 621 Berman, M. E., 341, 342, 345 Berman, S. M., 648 Bernat, E. M., 11, 12, 17, 54, 100, 101, 103, 116, 131, 136, 137, 166, 168, 171, 178, 235, 245, 249, 327, 429, 430, 432, 433, 445, 554, 592, 596, 597, 637, 644, 760, 767 Bernat, J. A., 664 Berner, W., 673 Bernstein, D., 699, 715 Bernstein, D. P., 716 Bernstein, P., 428 Berrebi, A., 391 Berridge, K. C., 97, 425, 426, 427 Berrios, G. E., 40 Berry, C. M., 178 Berry, J. W., 691 Berthot, B. D., 432 Bertsch, J. D., 51, 84, 433, 520 Besemer, S., 366 Besic, N., 153, 368 Bester-Meredith, J. K., 342 Bethell, E., 484 Beyer, K., 194 Bezdjian, S., 149, 339, 393 Bhanwer, A., 620 Bhullar, N., 263 Bickel, W. K., 650 Biederman, J., 647 Bihari, B., 645 Bihrle, S., 382, 386, 388, 587, 613, 644 Bijleveld, C. C. J. H., 366 Bijttebier, P., 145, 468, 489, 539, 540, 552,640 Bilukha, O., 371 Birbaumer, N., 80, 384, 405, 408, 434, 435, 594, 672 Bird, G., 61 Biringen, Z., 485 Birket-Smith, M., 40 Birt, A. R., 573, 594, 611, 616, 618, 621 Bitting, B. S., 685, 743 Bjork, J. M., 411, 672 Bjørkly, S., 39 Björkqvist, K., 457, 515 Black, D. W., 515 Black, P., 41, 734 Black, P. J., 47, 55, 443, 495, 573, 611, 612, 614, 620, 622, 697 Blackburn, R., 190, 220, 286, 300, 310, 321, 324, 516, 533, 534, 541, 543, 550, 551, 552, 623, 639, 715

Blackwood, N., 54 Blagov, P. S., 310, 324 Blair, C. B., 485 Blair, J., 31 Blair, J. R., 338, 405, 412 Blair, K., 80, 456, 664 Blair, K. S., 408, 409, 410 Blair, R., 664 Blair, R. J. R., 11, 50, 54, 80, 83, 89, 110, 114, 144, 145, 151, 152, 216, 276, 346, 381, 385, 401, 403, 404, 405, 406, 409, 410, 411, 412, 413, 425, 426, 427, 428, 435, 437, 438, 439, 440, 441, 447, 456, 462, 464, 465, 466, 492, 493, 494, 495, 520, 546, 553, 555, 589, 593, 621, 664, 672, 673, 756, 762, 764, 765, 769 Blais, J., 42, 57, 58, 68, 614, 690, 691, 692, 697, 733, 741, 744 Blake, C. A., 146, 763 Blanchard, D. C., 409 Blanchard, R. J., 409 Blashfield, R. K., 53, 55, 199, 200, 207, 232, 619 Blazei, R. W., 37 Block, J., 157, 232 Block, J. H., 157 Blonigen, D. M., 9, 10, 12, 13, 14, 16, 34, 35, 36, 100, 101, 1102, 30, 132, 147, 167, 168, 171, 174, 177, 218, 231, 245, 246, 248, 269, 270, 298, 302, 303, 325, 338, 346, 363, 423, 429, 436, 442, 446, 513, 517, 519, 587, 588, 589, 596, 597, 613, 615, 639, 641, 643, 646, 671 Blum, K., 426 Blumer, D., 427 Blumstein, A., 665 Bo, S., 42, 626 Boardman, C., 715 Boardman, C. R., 648 Boas, F., 27 Bobadilla, L., 338 Boccaccini, M. T., 42, 55, 56, 57, 148, 197, 468, 469, 612, 667, 685, 686, 687, 688, 693, 736, 737, 740, 741, 743, 744 Boccardi, M., 54, 384, 385, 402, 672 Boddy, C. R., 588, 596 Boden, J. M., 484 Bodholdt, R. H., 190 Bodin, S. D., 145, 150, 458, 462, 463, 464, 466, 482, 493, 497, 540, 624, 760 Boduszek, D., 63, 225 Boer, D. P., 573, 574, 594, 611, 616, 618, 667, 673, 683, 684, 698, 743 Boergers, J., 457 Boertien, S. D., 442 Boes, A. D., 389 Boettiger, C. A., 649 Bogaert, A. F., 670 Bogg, T., 263 Bohlin, G., 153 Boivin, M., 146, 468, 762 Bolinger, E. M., 593 Bolt, D., 511, 512 Bolt, D. M., 46, 557 Bond, L., 512 Bondy, B., 647 Bonfanti, L., 394 Bonifay, W., 63

Bonn, S. A., 577 Bono, J. E., 263 Bons, D. M., 388, 762 Bonta, J., 56, 683, 684, 711, 712, 713 Boochever, R., 612, 622 Book, A. S., 42, 45, 50, 64, 216 Boomsma, D. I., 646 Boone, K. B., 390 Booth, R. J., 622 Bor, W., 371 Borduin, C. M., 372, 649, 721 Bornovalova, M. A., 37, 269 Borroni, S., 147, 489 Borum, R., 683 Bothwell, R. K., 286 Bottlender, M., 647 Botvinick, M. M., 413 Bouchard, T. J., Jr., 34 Boulinguez, P., 413 Bousman, C. A., 647 Bowers, J. S., 764 Bowlby, J., 144, 363, 364, 442 Boy, F., 431 Bozarth, M. A., 97 Bozgunov, K., 59, 537, 639 Bradford, D. E., 447 Bradford, J. M., 688 Bradley, M., 101 Bradley, M. M., 80, 101, 276, 425, 432, 434, 439, 447, 520, 554 Bradley, R., 284 Bragesjö, M., 363 Branch, J., 146, 148, 155 Brand, E., 55 Brander, J. K., 724 Brandt, J. R., 487, 492, 537, 541, 625, 693 Brannen, C. L., 394 Brannen, D. N., 483 Braren, M., 645 Braun, C. H., 646 Braun, C. M. J., 555 Brazil, I. A., 50 Breitenbach, M., 316, 320 Brendgen, M., 458 Brennan, J., 150, 151, 152, 153, 154, 155, 406, 466, 518, 720, 762, 763 Brennan, L., 760 Brennan, P., 392 Brennan, P. A., 151, 366, 393, 406 Brennan, T., 316, 320 Brenner, H., 46 Bresin, K., 62, 101, 433, 514, 520, 689 Bridge, M., 61 Brieman, C. L., 50 Brigante, T. R., 167 Briken, P., 673 Brink, J., 84, 612 Brinkley, C. A., 85, 221, 222, 223, 224, 290, 461, 510, 537, 557, 590, 665, 690, 692 Brinthaupt, V. P., 461 Briskman, J., 595 Brislin, S. J., 14, 16, 17, 36, 247, 405, 412, 439, 446, 447, 464, 495, 760, 767, 771 Brittain, R. P., 673 Broadbent, D., 86 Broadbent, N. J., 428 Brocki, K. C., 153 Brodmann, K., 402

Brodsky, S. L., 463, 486 Brody, G. H., 647 Broekaert, E., 489, 540, 640, 693 Broerse, A., 427 Brook, J. S., 370 Brook, M., 50, 58 Brooks, N. S., 228, 545, 550 Brooks, R., 88 Brooks-Gunn, J., 368, 369 Brorson, H. H., 638 Brouillette-Alarie, S., 667 Brown, J. S., 13 Brown, J. W., 413 Brown, K., 613 Brown, M. A., 150, 343 Brown, S. D., 590 Brown, S. L., 44, 55, 356, 512, 665 Brown, T. A., 536 Brown, T. R., 734, 766 Brown, W. S., 391 Browne, K. D., 45 Brownlee, K., 550, 692 Brummelman, E., 760 Brunelle, C., 636 Brusco, M. J., 304, 305, 306, 307 Bruß, E., 553 Bryan, W. J., 173 Bryson, S. E., 485 Buchman-Schmitt, J. M., 17, 447 Bucholz, K. K., 636 Buchsbaum, M., 381, 383, 386 Buckels, E. E., 593, 594, 612 Buckholtz, J. W., 136, 411, 672 Buckman, J. F., 649 Budhani, S., 404, 410, 412, 413, 438, 493, 546, 553 Buehler, C., 365 Buffington, J. K., 216 Buffington-Vollum, J. K., 689, 698, 732, 733, 739, 740, 743 Bugliosi, V., 570 Buhle, J. T., 409 Buitelaar, J. K., 388, 403, 404, 762 Bukowski, W. M., 386, 484 Bullock, E. E., 515 Bulten, B. H., 50 Bundy, T., 166, 181, 578 Bundy, T. R., 579 Burger, J., 263 Burgess, A. G., 571 Burgess, A. W., 571, 577 Burgess, G. C., 413 Burk, C., 342 Burke, H. C., 354 Burke, J. D., 149, 154, 480, 481, 741 Burkhart, B. R., 668 Burnett, S., 151 Burnette, M. L., 52, 515 Burns, G. L., 461 Burns, L., 648 Burns, T., 390 Burt, S. A., 340, 341, 672, 769 Burton, R., 30 Buschman, T. J., 408 Busconi, A., 696 Bush, G., 645 Bush, G. W., 173 Bush, J., 195

# 782

Bushman, B. J., 483, 613, 614, 624, 760 Buss, A. H., 40, 221 Buss, D. M., 443, 589 Busse, D., 695 Bussière, M. T., 666 Butcher, J. N., 213, 220 Butler, G., 468 Butler, M. A., 51, 149, 152, 518, 640, 741 Butler, S., 720, 721, 722 Butterfield, P., 405 Buzina, N., 80 Byrd, A. L., 146, 406, 492, 672, 761, 763, 769 Cacciola, J. S., 512, 515, 648, 715 Cacioppo, J. T., 434 Caddell, J. M., 515 Cadoret, R. J., 342, 517 Cahill, M. A., 557, 595, 694, 741 Cain, N. M., 287 Caine, E. D., 626 Calamari, J. E., 551 Calder, A. J., 409, 554 Caldwell, M., 154, 496, 699, 700, 720, 721, 739 Caldwell, M. F., 45, 62, 286, 692, 715, 721, 722, 738 Cale, E. M., 517, 617, 690, 696, 715 Calhoun, K. S., 664, 669 Calhoun, V. D., 50, 384, 402 Calinski, R. B., 305 Camara, F. P., 532, 545 Camp, J., 535, 553, 667, 695, 717, 740 Camp, J. P., 616, 618, 697 Campbell, A. C., 671 Campbell, D. T., 95, 138, 248 Campbell, J. A., 59 Campbell, J. S., 464, 509, 553, 690, 719, 741 Campbell, M., 694 Campbell, M. A., 146, 222, 354, 618, 619, 620, 625, 694, 699 Campbell, W. K., 264, 287 Campos, J. J., 405, 485 Candel, I., 538 Capaldi, D. M., 519 Caperton, J., 667, 687, 737 Caprara, G. V., 483 Caputo, A. A., 463, 486 Card, N. A., 457, 458 Cardinale, E. M., 151, 384, 405, 464, 764 Carey, N., 95 Carlson, E. A., 363 Carlson, E. N., 198 Carlson, K., 31 Carlson, K. S., 483, 484 Carlson, S. M., 485 Carlson, S. R., 103, 128, 325, 338, 429, 637, 771 Carlstrom, E., 771 Carmichael, B., 383 Caro, R. A., 30 Caron, M. G., 341 Carr, T. H., 86 Carré, J. M., 59, 61, 62, 225, 230, 404 Carrey, N. J., 492 Carter, C. S., 413, 427, 428, 645, 646 Carter, G. L., 671 Carter, R., 59, 529

# Author Index

Carter, S., 626

Carter, V. B., 30 Carver, C. S., 65 Casanova, M. F., 402 Cases, O., 342 Casey, B. J., 12, 106, 410, 412, 413, 426, 431, 444, 445, 767 Casey, E, A., 669 Casey, H., 390 Casey, J. O., 514, 648, 686, 715 Cashel, M. L., 625, 691 Cashman-Brown, S., 599 Caspi, A., 7, 8, 25, 37, 68, 129, 131, 144, 263, 298, 299, 321, 342, 359, 367, 369, 424, 459, 460, 488, 515, 538, 597, 637, 647, 700, 718, 741, 761, 771 Castellanos, F. X., 110, 345 Castellanos-Ryan, N., 137 Catchpole, R. E. H., 496, 513 Cauchi, A. J., 150, 154, 155, 720, 721, 723, 763 Cauffman, E., 146, 147, 148, 155, 318, 319, 321, 463, 464, 468, 482, 540, 550, 551, 553, 623, 693, 694, 695, 696, 719, 720, 739, 741, 763 Cavus, H., 442 Cecil, C. A., 150, 156 Centifanti, L. C. M., 492, 538 Čėsnienė, I., 59, 536 Chabrol, H., 484 Chacko, A., 485 Chadwick, A., 394 Chakhssi, F., 699, 715 Chamberlain, P., 372 Chamberlain, S. R., 134 Chamberlin, R., 370 Chambers, C. T., 484 Chamorro-Premuzic, T., 239, 589, 594 Chan, F., 363 Chan, R. C. K., 431 Chan, S.-C., 410 Chandler, M., 486, 494 Chang, J. J., 625 Chang, Y.-Y., 647 Chapman, A. L., 232, 512 Chapman, J. C., 551 Chapman, S. B., 393 Charman, T., 216, 404, 437, 546, 553 Chase, K. A., 614 Chase, M., 167 Chattha, H. K., 550, 692, 695 Chávez, J. X., 638 Chen, A., 393 Chen, C., 406, 407, 440, 441, 447, 764 Chen, D. R., 221 Chen, G., 411, 672 Chen, P., 595 Cheney, R., 765 Cheng, Y., 151, 405, 494, 497 Cherek, D. R., 412, 626 Chernyshenko, O. S., 263 Cheung, H., 483 Chevalier, C. S., 42, 57 Chiaburu, D. S., 594 Chien, C.-C., 647 Childress, A. R., 645 Childs, K., 696 Chiodo, D., 357

Chmielweski, M., 18 Choi, E. H., 342 Christensen, A. J., 135 Christian, E., 221, 224, 597 Christian, R., 463, 486, 497, 540 Christiansen, K. O., 519 Christianson, S. A., 403 Christie, B. R., 393 Christie, R., 612 Christofferson, S. M. B., 667 Chung, I.-J., 368, 700 Church, T. A., 262 Churchill, W., 30 Chusmir, L. H., 588 Cicchetti, D., 12, 95, 149, 364, 445, 674, 767 Cima, M., 146, 152, 234, 468, 551, 593, 616, 624 Cipolotti, L., 427 Claes, L., 145, 313, 321, 324, 468, 539 Clark, A., 700 Clark, A. P., 147, 220, 425, 435, 479, 510, 514, 538, 701, 741, 757 Clark, D., 46, 535, 552, 691, 697 Clark, D. A., 354, 372, 522 Clark, F., 437, 664 Clark, H. J., 42, 45, 57, 733 Clark, J., 180, 205, 734, 741, 743, 744, 745 Clark, J. C., 745 Clark, J. W., 468 Clark, L. A., 9, 18, 99, 129, 199, 200, 215, 261, 263, 281, 288, 468, 481, 482, 642 Clark, R. E., 428 Clark, S., 519 Clarkin, J. F., 718 Claus, E. D., 645, 649 Clayton, A. H., 381 Cleckley, H., 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 30, 40, 41, 48, 49, 50, 51, 52, 53, 80, 88, 94, 100, 103, 116, 118, 127, 134, 135, 144, 166, 167, 169, 170, 175, 176, 177, 178, 179, 180, 189, 200, 213, 214, 217, 220, 232, 234, 247, 249, 250, 259, 264, 266, 282, 283, 286, 288, 289, 290, 298, 299, 300, 301, 303, 325, 326, 423, 442, 480, 481, 482, 483, 509, 510, 512, 513, 520, 531, 581, 585, 590, 592, 597, 598, 611, 614, 620, 621, 623, 635, 662, 696, 710, 718, 755, 756, 758 Clements, C. B., 145, 458, 494, 512, 553 Clithero, J. A., 410 Cloninger, C. R., 104, 436, 465, 480, 517, 519, 636, 643, 647 Clower, C. E., 286 Clyman, R. B., 485 Coccaro, E. F., 341, 343, 345, 410, 626 Coffey, K., 174, 235, 589 Cohen, D. J., 149 Cohen, G. L., 483 Cohen, I. M., 285, 496, 640, 693 Cohen, J., 176, 665 Cohen, J. D., 413, 426, 427, 428, 446 Cohen, P., 354, 359, 370, 481 Cohn, M. D., 151, 382 Coid, J., 47, 314, 320, 529, 533, 538, 541, 543, 550, 552, 553, 593, 612, 618, 639, 650, 684, 687, 690, 740

Coid, J. W., 356, 357, 366, 533, 534, 541, 550, 552, 588, 639, 663, 667, 712 Coie, J. D., 368, 457, 458 Coker-Appiah, D. S., 409 Coles, M., 437 Coles, M. G., 428, 646 Colins, O. F., 486, 488, 489, 538, 540, 547, 548, 552, 640, 693, 760 Colledge, E., 114, 151, 404, 406, 437, 438, 464, 492, 493, 546, 553, 593 Colletti, P., 382, 385, 391, 402, 403, 596, 644, 645 Collier, D. A., 342, 647 Collins, P. F., 97 Colliver, J. D., 638 Colwell, L. H., 535, 536, 740 Compton, W. M., 638 Condon, C. A., 41 Cone, J. D., 737 Conger, A. J., 177 Conger, R. D., 246, 370 Conner, K. R., 599, 626 Conradi, H. J., 442 Conrod, P., 314, 321 Contini, V., 647 Contreras-Rodriguez, O., 383 Conway, K. P., 638 Cook, L. G., 393 Cook, N. E., 625 Cook, T. D., 248 Cooke, D. J., 40, 42, 45, 46, 47, 48, 49, 63, 146, 147, 172, 189, 190, 197, 199, 200, 201, 202, 205, 206, 207, 230, 285, 286, 287, 290, 292, 342, 354, 356, 359, 363, 365, 372, 388, 461, 484, 488, 509, 511, 512, 517, 518, 521, 522, 531, 532, 533, 534, 535, 536, 537, 540, 557, 559, 613, 615, 619, 690, 691, 697, 715, 734, 742, 765 Cooney, N. L., 336 Cooper, A., 287 Cooper, A. M., 287 Cooper, B. A., 484 Cooper, B. S., 613, 668 Cooper, H., 263 Cooper, T. B., 343 Copas, J., 683, 684 Cope, L. M., 50, 61, 62, 384, 402, 411, 412, 645, 672 Copeland, W. E., 156 Copestake, S., 63, 529, 533, 535, 540 Coppola, F. F., 590 Corbitt, E. M., 282, 286, 288, 289 Cordwell, L., 589, 669 Corley, R. P., 104, 129, 431, 646 Cormack, R. M., 304 Cormier, C. A., 42, 46, 683, 699, 710, 712, 736, 739 Cornélis, C., 672 Cornell, A. H., 114, 150, 458, 462, 464, 465, 466, 493, 497 Cornell, D. G., 157, 458, 468, 512, 614, 617, 692, 693, 741 Cornwell, B. R., 434 Corr, P. J., 97, 98, 99, 100, 108, 109, 111, 671 Corrado, R. R., 147, 206, 285, 486, 496, 640, 693, 694 Correll, J., 484

Cortoni, F., 672 Cosmides, L. E., 180 Costa, P. T., 96, 172, 173, 180, 201, 261, 262, 718 Costa, P. T., Jr., 135, 157, 262, 424, 641, 757 Costello, A. B., 537 Costello, E. J., 156 Côté, G., 496, 693 Cothern, L., 719 Cottler, L. B., 638 Counts, C. A., 152, 518 Coupland, R., 625 Cox, D., 45, 758 Cox, D. N., 40, 146, 206, 218, 219, 356, 531, 588, 639, 687, 698, 741 Cox, J., 180, 310, 321, 324, 686, 732, 733, 735, 736, 742, 744, 745, 746 Coy, K. C., 11 Crabbe, J., 641 Crago, R. V., 356, 357 Craig, M., 665 Craig, M. C., 62, 386, 402 Craig, R. J., 189 Craig, R. L., 239, 442 Cramer, P., 483, 484 Crane, R. S., 96 Crapanzano, A. M., 457 Craver, C. F., 86 Crawford, T. J., 427 Crawley, J. N., 342 Creevy, C., 315, 321, 614, 623 Crego, C., 10, 12, 13, 22, 39, 48, 49, 50, 52, 53, 54, 55, 68, 167, 169, 170, 175, 177, 236, 237, 238, 250, 270, 281, 282, 291, 756, 758 Cressey, D., 28 Criaud, M., 413 Crick, N. R., 457, 458, 515, 690 Critchley, H. D., 381, 383, 392 Crombez, G., 54, 175 Cronbach, L., 136 Cronbach, L. J., 175, 199, 200, 207 Crone, E. A., 720, 725 Crossley, L., 622 Crossman, A., 483 Crowe, S. L., 409 Crowell, S. E., 647 Crowley, T. J., 411, 412 Cruise, K. R., 157, 282, 458, 664, 739 Cummings, J. L., 383, 390 Cunningham, M. D., 733 Cunningham, P. B., 721 Curtin, J. J., 11, 51, 84, 88, 90, 168, 390, 407, 433, 434, 447, 487, 520, 537, 625, 671, 693, 716 Curtis, N. M., 372, 721 Curtis, W. J., 12 Cuthbert, B. N., 17, 101, 168, 425, 432, 554, 759, 769 Cyterski, T. D., 692 Czar, K. A., 515 Dabbs, J. M., 174, 235, 589 Dadds, M. R., 114, 145, 150, 151, 152, 153, 154, 155, 250, 346, 406, 409, 426, 439, 466, 493, 496, 518, 540, 549, 551, 553, 595, 624, 625, 700, 720, 721, 723, 724, 762, 763

Dåderman, A. M., 55, 56 Dahl, R. E., 290, 720, 725 Dahle, K., 695 Dahle, K.-P., 667 Dahlen, E. R., 515 Dahmer, L., 578, 579, 580 Dalal, D. K., 600 Dale, P. S., 150, 344 Dalwani, M., 402 Daly, T. E., 719, 739 Damasio, A. R., 51, 99, 381, 388, 389, 390, 427, 518, 644 Damasio, H., 381, 388, 390, 427, 518, 645 Dandreaux, D. M., 148, 359, 459, 460, 465, 490, 496, 700 Dane, H., 493, 497 Dane, H. A., 458, 462 Dane, H. E., 150 Danesh, J., 515 Daoud, Y., 734 Darby, A., 390 Darden, L., 86 Darjee, R., 667 Dark, V. J., 86 Das, J., 45, 489, 539, 547, 550, 552, 640 Das, M., 385 Dasen, P. R., 691 Dash, L., 30 Datyner, A. C., 156 Davidge, K. M., 342 Davidov, M., 484 Davidson, R. J., 381, 386, 390, 391, 427, 428, 432, 438, 445 Davies, G., 626 Davies, P. L., 646 Davis, D., 578, 579 Davis, J. M., 664 Davis, K. M., 745 Davis, M., 98, 168, 425, 432 Davis, R. D., 202, 619 Davis, R. O., 641 Dawel, A., 404, 447, 494, 554 Dawson, D. A., 638 Dawson, M. E., 12, 390, 433, 494 Dawson, S. E., 206 Day, J. J., 371 Dayan, P., 410 de Almeida, R. M. M., 342 De Bolle, M., 263, 489, 693 De Brito, S., 613 De Brito, S. A., 402 de Castro, B., 483 De Clercq, B., 135, 263 de Fockert, J. W., 86 De Fruyt, F., 263 de la Osa, N., 146, 467 De Los Reyes, A., 468 de Oliveira-Souza, R., 388, 402, 403 De Pauw, S., 263 de Ruiter, C., 39, 45, 489, 536, 541, 543, 544, 547, 550, 552, 640, 688, 699, 715 de Tribolet-Hardy, F., 533, 542 de Vogel, V., 536, 544, 688, 715 de Wied, M., 151, 152, 405, 464, 494, 547, 552, 554 De Wolf, A. H., 55 Deakin, J. F. W., 383 Dearing, K. F., 458

## 784

Deary, I. J., 58, 59 Deater-Deckard, K., 370 Debowska, A., 63, 225 DeBurger, J., 571 Decety, J., 88, 151, 405, 406, 407, 408, 439, 440, 441, 442, 447, 494, 764, 765 Declercq, F., 614 Decoene, S., 145, 468, 539 DeCoster, J., 62, 144, 285, 355, 456, 495, 612, 667, 683 Decuyper, M., 263, 266, 317, 320 Deeley, Q., 405 DeGarmo, D. S., 113 DeGue, S., 663 Deković, M., 372, 720 Delfino, R. J., 134 DeLisi, K. M., 147 DeLisi, M., 147, 341, 718 DelVecchio, W. F., 262 DeMartino, P. A., 169 DeMatteo, D., 39, 57, 58, 587, 593, 686, 732, 733, 735, 736, 737, 738, 744, 746 Dembo, R., 145, 489, 519, 540, 640, 696 Demetriou, C. A., 317, 321, 538, 548, 551 Deming, A. M., 368, 490, 761 Dempster, R. J., 614 den Boer, J. A., 85, 407, 427, 440, 765 Denenberg, V. H., 391 DeNeve, K. M., 263 Denissen, J. A., 483 Dennison, S., 665 Depue, B. E., 413 Depue, R. A., 97, 114, 249 Derefinko, K. J., 10, 13, 50, 58, 68, 100, 132, 170, 178, 180, 232, 250, 259, 263, 266, 269, 271, 275, 286, 303, 443, 513, 551, 552, 573, 590, 596, 641, 650 Derks, Y., 595 Derksen, J. J., 518 Dernevik, M., 363 Derntl, B., 520 Derringer, J., 53, 170 Déry, M., 496, 693 Derzon, J. H., 358, 368 Desforges, D. M., 740 Desimone, R., 407 D'Esposito, M. T., 393 Deuling, J. K., 594, 613 DeVries, A. C., 342 DeYoung, C. G., 96, 263, 342 Diamond, P. M., 221, 590, 665 Dias, R., 427 Dicataldo, F., 625 DiCicco, T. M., 45, 550, 640 Dick, D. M., 138, 343, 344, 646, 648 Dickens, S. E., 216 Dickson, N., 299, 459 Dieterich, W., 316, 320 Dietrich, A. M., 667 Dietz, P., 580 Digman, J., 261 Dikman, Z. V., 136, 646 DiLillo, D., 663 Dillard, C. L., 482, 487, 490 Dillon, A. L., 135 Dimond, D., 571 Dindo, L., 94, 101, 168, 178, 179, 425, 435, 592, 596, 597 Dinero, T. E., 668

# Author Index

Dinov, I. D., 383 Dinsmore, J. A., 638 Dishion, T. J., 113, 368, 443, 459, 723, 760 Dmitrieva, J., 148, 155, 318, 321, 623, 693, 696, 719, 720 Dobbert, D. L., 574 Dobson, J. C., 579 Dobson-Stone, C., 150 Dodd, J., 443 Dodge, K. A., 368, 370, 410, 457, 458, 597, 613, 625 Dodson, M. C., 496, 762 Doiron, D., 771 Dolan, M., 146, 383, 509, 513, 529, 534, 539, 546, 553, 595, 626 Dolan, M. C., 45, 387, 405, 518, 593, 626, 764 Dolan, R., 405 Dolberg, H., 61, 251, 513 Doll, H., 684 Domènech, J. M., 146, 467 Donahue, E. M., 424 Donchin, E., 428, 645 Dong, L., 340, 488 Doninger, N. A., 557 Donnellan, M. B., 174, 245, 246, 671 Donnelly, J., 534, 639 Donnelly, J. M., 346 Donnelly, J. P., 190, 310, 321, 552, 623 D'Onofrio, B. M., 393 Donoghue, K., 551 Donohue, K. F., 434 Doolan, M., 371 Doreleijers, T., 490, 550, 614 Doren, D., 716 Dorjee, D., 764 Doucette, N. L., 146 Dougherty, D. M., 412 Douglas, J., 443, 571, 573, 574 Douglas, J. E., 577 Douglas, K., 52, 56, 626 Douglas, K. S., 39, 45, 46, 47, 55, 135, 148, 232, 312, 321, 488, 495, 516, 532, 538, 552, 573, 612, 620, 621, 667, 682, 683, 684, 687, 689, 690, 691, 694, 695, 698, 699, 711, 733, 740, 741, 743, 746, 770 Douglas, V. I., 110 Dowdy, L., 614 Doyle, A. E., 105, 106, 345, 647 Doyle, M., 513, 534, 626 Dozois, D., 149 Drabick, D. A. G., 595 Drislane, L. E., 8, 12, 13, 14, 15, 16, 36, 54, 64, 102, 103, 132, 134, 135, 147, 148, 166, 170, 172, 175, 178, 198, 235, 236, 237, 238, 239, 246, 247, 249, 250, 264, 291, 292, 297, 298, 315, 320, 321, 324, 346, 354, 423, 424, 425, 426, 429, 431, 433, 436, 443, 447, 448, 517, 538, 552, 570, 572, 576, 581, 587, 588, 589, 592, 597, 598, 615, 623, 696, 698, 717, 718, 726, 742, 755, 756, 758, 760, 768, 771, 772 Driver, J., 86 Dror, I. E., 58 Drugge, J., 574, 618, 673 D'Silva, K., 738

Duckert, F., 638 Dudek, L. A., 574, 575 Duggan, C., 199, 738 Dulawa, S. C., 341 Dumais, S. T., 81 Dumenci, L., 537 Dunbar, S. B., 760 Duncan, J., 407 Duncan, L. E., 646 Duncan, S., 216, 743 Duncan, S. A., 45, 665, 738 Dunkle, K., 669 Dunlop, B. W., 426 Dunlop, W. L., 589 Dunn, J., 484 Dunne, M., 515 Durbeej, N., 639 Durbin, C. E., 95, 103, 424, 644, 769 Duros, R. L., 45, 550, 640 Dutton, K., 173, 589 Duwe, G., 571 Dvorak-Bertsch, J. D., 11, 168, 434 Dvoskin, J., 738 Dyck, H. L., 694 Dywan, J., 646 Earle, J., 574, 618, 673 Earls, F., 369 Easteal, S., 341 Eaton, N. R., 536 Eaves, D., 56, 617, 683 Ebrite, T., 571, 572 Eccles, J. S., 135 Eckel, L. A., 152, 518 Eckenrode, J., 371 Edelbrock, C. S., 7, 8, 128, 134, 156, 289, 336, 644 Edelmann, R. J., 220 Edens, J. F., 9, 16, 36, 42, 45, 46, 47, 54, 55, 57, 147, 148, 168, 172, 174, 176, 180, 205, 212, 215, 216, 219, 231, 247, 248, 251, 302, 312, 319, 321, 325, 356, 464, 489, 495, 509, 514, 521, 532, 535, 536, 552, 553, 556, 557, 573, 590, 595, 597, 612, 616, 617, 625, 664, 665, 682, 685, 686, 687, 689, 690, 693, 694, 695, 696, 697, 698, 701, 711, 719, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 771 Edwards, J. R., 204 Edwards, M. J., 216 Egan, S. S., 216 Egan, V., 593 Egger, H. L., 485 Egger, J., 595 Egger, S. A., 571 Eggum, N. D., 99 Egner, T., 645 Eher, R., 612, 674, 695 Ehlers, C. L., 343 Ehrhardt, A. A., 518 Eisenbarth, H., 538, 542, 553 Eisenberg, N., 99, 106, 107, 108, 484 Eisenberger, N. I., 342 Eisner, M. P., 354 Eke, A. W., 617, 688 Ekholm, S., 383 Ekman, P., 194, 213 El Marroun, H., 393

El Masry, Y., 151, 346, 406, 439, 466, 493, 553 Eley, T. C., 336 Elizur, Y., 549, 551, 762 Elkind, D., 483 Elkins, I. J., 128, 325, 637, 771 Elkovitch, N., 688 Ellingson, J. M., 8, 47, 289, 516, 550, 635, 644, 647 Elliott, A. C., 393 Elliott, D. S., 367, 368, 669 Ellis, L., 365 Ellis, M., 291, 540, 624 Ellis, M. L., 145, 467, 482, 494, 553 Elsass, P., 206, 531, 626, 698 Elsner, K., 733, 739 Embley, I., 59, 529 Emde, R. N., 405, 485 Eme, R. F., 128 End, A., 234, 435 Endicott, J., 282, 480 Endrass, J., 532, 544, 667 Enebrink, P., 540 Eninger, L., 153 Eno Louden, J., 313, 320, 324, 445, 486 Epstein, M., 488 Epstein, M. E., 694, 741 Epstein, S., 249 Erdberg, P., 194 Erickson, K., 61, 385, 766 Ermer, E., 45, 50, 62, 384, 402, 403, 665 Ernst, D., 250 Eron, L. D., 457 Essau, C. A., 145, 303, 467, 514, 516, 539, 540, 548, 551, 552 Esteller, A., 13, 132, 178, 235, 267, 273, 424, 538 Esteves, F., 84 Etkin, A., 409, 645 Evans, A. D., 483 Evans, D. E., 483 Evans, L., 54 Evenson, N. N., 393 Everall, I. P., 647 Ewles, C. D., 715 Eysenck, H. J., 17, 178, 217, 218, 260, 551 Eysenck, S. B. G., 178, 217, 218 Eysenck, S. G., 260 Ezpeleta, L., 146, 155, 467 Fabiano, E. A., 715 Fabiano, G. A., 145 Fagan, P. J., 135 Fager, J., 26 Fahim, C., 402 Fair, D., 109 Fairbank, J. A., 515 Fairchild, G., 387, 388, 402, 492, 546, 554 Fairfax-Columbo, J., 735 Falkenbach, D. M., 216, 315, 321, 324, 488, 597, 614, 616, 623, 693 Falki, M., 616 Fallon, J., 587 Fanselow, M. S., 432 Fanti, K. A., 46, 146, 155, 156, 317, 321, 324, 443, 467, 489, 529, 538, 539, 540, 548, 549, 551, 554, 691 Faraone, S. V., 105, 647 Farber, B. A., 714

Farell, J. M., 148, 490, 496, 700 Farina, E., 485 Farmer, R. F., 232, 512 Farrell, J. M., 359, 465 Farrington, D. P., 299, 354, 355, 356, 357, 358, 359, 363, 364, 365, 366, 367, 368, 369, 370, 373, 386, 425, 456, 479, 480, 588, 756, 771, 772 Farwell, B., 30 Fawcett, D., 220 Fazekas, H., 151, 464, 512, 557 Fazel, S., 39, 342, 515, 647, 667, 684, 699, 712 Feighner, J. P., 282, 283, 284 Feilhauer, J., 146, 468, 547, 551 Fein, G., 136 Feinn, J., 128 Feinstein, A. R., 281 Fejfar, M. C., 176, 263 Felt, B. T., 386, 410 Felthous, A. R., 39, 534 Feng, S., 344, 347 Fenton, M. C., 638 Fergusson, D. M., 365 Fernandes, C., 431 Fernandez, K., 740 Fernandez Smith, K., 745 Ferrari, M. M., 574 Ferrell, R. E., 647 Ferris, C. F., 342, 343 Fetterman, A. K., 263 Few, L. R., 54, 170, 172, 177, 221, 224, 225, 240, 241, 242, 243, 244, 264, 267, 269, 270, 273, 291, 757, 758, 759 Ficks, C. A., 340, 341, 342 Figlio, R. M., 23 Figueredo, A. J., 589, 696 Findley, D., 484 Findling, R. L., 464, 498, 693, 763 Finger, E. C., 152, 382, 385, 403, 411, 412, 464, 494, 495 Fink, B. A., 598 Finn, J. A., 757 Finn, P., 136 Finn, P. R., 433, 520 Finney, J. C., 215 Finy, M. S., 517 Firestone, P., 648, 688 First, M. B., 281, 356, 669, 758 Fischer, D. G., 365 Fischer, E. G. J., 673 Fischer, S., 178, 199, 591 Fishalow, J. L., 15 Fisher, L., 493 Fisher, P., 97 Fisher, R. P., 191 Fiske, D. W., 95, 138 Fister, S. M., 178, 199, 591 Fite, P. J., 61, 145, 227, 228, 229, 613, 625 Fitzgerald, D. A., 410 Fitzgerald, L. F., 669 Fitzgerald, S., 689 Fitzpatrick, C., 266, 320 Fitzpatrick, C. M., 171, 220, 384, 423, 615, 669 Fleeting, M., 364 Fleming, K. A., 644 Flight, J. I., 614 Flint, J., 646, 648

Flisch, R., 620 Flor, H., 434 Flores-Mendoza, C. E., 533, 536, 537, 545, 552 Flórez, G., 205 Flory, J. D., 647 Flouri, E., 595 Flykt, A., 84 Flynn, G., 592 Fodor, J., 180 Foell, J., 10, 127, 134, 137, 327, 424, 426, 428, 430, 672, 767 Foley, D. L., 342 Fonagy, P., 720 Fontaine, N. M., 148, 153, 150, 154, 339, 468, 538, 761, 762 Fonteille, V., 672 Ford, T., 468 Forgatch, M. S., 27 Forman, D. R., 760 Forman, J. B. W., 283 Foroud, T., 648 Forouzan, E., 197, 363, 364, 509, 512, 517, 518, 521 Forsman, A., 383 Forsman, M., 50, 58, 149, 150, 339, 491 Forsyth, D. R., 263, 596 Forth, A. E., 42, 44, 45, 47, 57, 58, 68, 146, 206, 219, 342, 354, 356, 366, 438, 456, 467, 479, 482, 483, 486, 487, 496, 512, 513, 538, 551, 553, 554, 614, 618, 625, 639, 640, 665, 683, 690, 693, 700, 719, 732, 733, 735, 738, 741, 743, 744, 760, 761 Fossati, A., 147, 489 Foster, E., 27 Foster, H., 368 Foster, S. L., 737 Foulkes, L., 61 Fowler, J. S., 645 Fowler, K. A., 100, 147, 166, 177, 179, 190, 211, 214, 412, 414, 510, 551, 685, 742 Fowler, T., 150, 342, 495, 647, 648 Fowles, D. C., 10, 11, 17, 54, 94, 97, 98, 100, 101, 131, 153, 165, 168, 170, 172, 178, 179, 224, 235, 266, 284, 298, 300, 346, 414, 422, 425, 428, 431, 432, 435, 445, 447, 465, 481, 573, 592, 596, 597, 615, 644, 673, 696, 698, 721, 742, 756, 767, 769 Fox, B. H., 373 Fox, J. A., 570, 571, 572, 573, 574 Fox, N. A., 341, 391 Fraley, C., 306 Fraley, R. C., 442 Frame, C. L., 597 Frances, A. J., 283 Francis, M. E., 622 Francis, R. C., 95 Frank, G., 570 Frank, M. G., 194 Frank, R., 381, 427 Fransson, G., 46, 691 Fraser, J., 145, 540 Frazelle, J., 41 Frazer, D., 463, 486, 540 Frederick, C., 667 Fredrickson, N., 493, 494

Freedman, D., 738 Freeman, D., 28 Freeman, M., 128 Freeman-Gallant, A., 366 Freese, R., 534 Freeston, A., 595 Freeston, M., 314, 320 Freidenfelt, J., 368 Freimuth, T., 618, 619 French, S., 146, 699 Freud, S., 3 Frick, P. J., 9, 11, 15, 45, 50, 58, 68, 95, 100, 105, 106, 110, 111, 112, 114, 115, 131, 132, 144, 145, 146, 148, 149, 150, 151, 152, 153, 155, 156, 291, 298, 303, 319, 321, 324, 339, 340, 359, 367, 423, 424, 425, 426, 428, 431, 443, 445, 456, 457, 458, 459, 460, 462, 463, 464, 465, 466, 467, 468, 480, 481, 482, 483, 484, 485, 486, 487, 488, 490, 493, 494, 496, 497, 498, 510, 512, 514, 515, 521, 538, 539, 540, 548, 550, 551, 553, 555, 557, 573, 574, 595, 598, 613, 615, 624, 625, 646, 664, 686, 693, 700, 701, 715, 719, 720, 721, 743, 757, 760, 761, 762, 763, 767, 768, 769 Fridell, M., 638 Friderici, K., 648 Fridlund, A., 404 Friedman, L. M., 445 Friedman, N. P., 136, 414, 644 Frimer, J. A., 589 Frith, C. D., 405 Frith, U., 403 Fritz, M. V., 540, 549 Frodi, A., 363 Frogner, L., 489 Frost, A., 145, 540 Frost, A. D. J., 595 Frost, B. C., 176 Fu, G., 483 Fulero, S. M., 510 Fullam, R. S., 387, 405, 626, 764 Fuller, S., 484 Fulton, J. J., 168, 176, 231, 251, 597, 697 Funder, D., 212 Fung, A. L., 529, 539, 540, 549 Fung, M. T., 152, 494, 554 Furnham, A., 734, 745 Gable, P. A., 671 Gacono, C. B., 39, 42, 47, 55, 58, 190, 287 Gage, P., 381, 427 Gagnon, N. C., 741 Galaburda, A. M., 381, 427 Galietta, M., 716 Gall, J. S., 391 Gallinat, J., 647 Gallo, A., 648 Galloway-Long, H. S., 111, 468 Galushkin, A. I., 88 Galvan, A., 672 Galvin, P., 588 Gamez, W., 641 Gangestad, S. W., 176 Ganis, G., 387

## Author Index

Gao, Y., 12, 152, 363, 364, 390, 391, 431, 482, 494, 529, 549, 554, 585, 587 Garbanati, J. A., 391 Garcia, C. E. D., 647 Gardner, B. O., 42, 685, 743 Gardner, F., 149, 762 Gardner, R. G., 594 Garon, N., 485 Garozzo, R., 645 Garske, J. P., 176 Gasperi, M., 10, 101, 135, 175, 235, 291, 433, 598 Gatzke-Kopp, L. M., 383, 385, 390 Gaudet, L. M., 50 Gaughan, E. T., 178, 262, 269, 270, 593 Gazzola, V., 85, 407, 440, 765 Ge, X., 370 Gefeller, O., 46 Gehring, W. J., 137, 428, 430, 520 Geiger, F., 59, 553 Geis, F., 612 Geiselman, R. E., 191 Gendreau, P., 614, 666, 682, 683, 684, 698, 699, 742 Gentile, B., 264 Gentry, C., 570 George, R., 589 Georgiou, G., 551 Georgiou, S., 146, 467, 540 Gerfen, C. R., 426 Gerhardt, M. W., 263 Gervais, M. M., 589 Geyer, M. A., 341, 743 Giancola, P. R., 650 Gibbon, M., 232, 356, 669, 758 Gibbs, J. C., 484 Giere, R. N., 86 Gilbert, F., 151 Gilder, D. A., 343 Gillard, N. D., 42, 57, 58 Gillen, C. T., 539 Gillespie, N. A., 649 Gilligan, V., 591 Gillman, L., 622 Gillstrom, B., 512 Gil-Mohapel, J., 393 Ginns, E. I., 342 Giros, B., 341 Gizer, I. R., 341, 647 Gjerde, P. F., 483, 484 Gladden, P. R., 589 Glascher, J., 443 Glass, S. J., 85 Glatt, S. J., 647 Glenn, A. L., 50, 54, 62, 69, 152, 385, 388, 391, 406, 589, 648, 664, 672, 673 Glennan, S. S., 86 Glover, G. H., 645 Glover, N. G., 178, 286, 590 Goddard, M. E., 35, 344 Godt, N., 553 Godwin, G. M., 572 Goethals, I., 381 Goggin, C., 666, 682, 684, 698, 742 Goldberg, L. R., 60, 178, 200, 201, 206, 250, 263 Golden, C. J., 715 Golden, R., 9

Goldman, D., 759 Goldman-Rakic, P. S., 427 Goldsmith, H. H., 27, 106 Goldstein, D. B., 12, 17 Goldstein, D. S., 551 Goldstein, R. B., 289, 517, 638 Goldweber, A., 155, 319, 321, 464, 551, 720, 763 Gonçalves, R. A., 529, 533, 538, 545, 695 Gontkovsky, S. T., 715 Goodman, R., 145, 339, 468, 480, 481 Goodwin, D. K., 173 Goodyer, I. M., 546, 554 Gorby, B. L., 571, 572 Gordon, A., 667, 712, 713, 715, 738 Gordon, A. E., 714 Gordon, H. L., 234, 435 Gordon, H. M., 760 Gorenstein, E. E., 7, 81, 88, 128, 637, 644, 650 Gorwood, P., 648 Gotham, H. I., 643 Gottesman, I. I., 27, 345, 519 Gottfredson, D. C., 368, 369 Gottfredson, G. D., 369 Gottfredson, M., 594, 643, 672 Gough, H. G., 180, 200, 217, 436, 513 Gould, T. D., 345 Goulter, N., 146, 152, 156, 443 Goyer, P. F., 381, 386 Grabenhorst, F., 644 Grabowski, T., 381, 427 Grace, R. C., 595, 667, 696 Graetz, B. W., 769 Grafman, J., 389 Graham, F. J., 664, 670, 671 Graham, J., 368 Graham, J. R., 213, 215, 220, 552, 593 Graham, N., 146, 364 Grandin, T., 586 Grandy, D. K., 341 Granero, R., 146, 467 Granger, D. A., 152 Granhag, P. A., 196 Grann, M., 542, 547, 552, 553, 667, 684, 688, 695, 712 Grant, A. M., 176 Grant, B. F., 289, 638, 641 Grant, I., 626 Grant, J. E., 134 Gray, A., 696 Gray, J. A., 81, 88, 96, 97, 98, 100, 108, 112, 115, 170, 300, 394, 696, 671 Gray, J. R., 263 Gray, K. G., 167 Gray, N., 529, 665 Gray, N. S., 63, 593, 612, 614, 621, 689 Gray, R., 442 Graziano, W. G., 263, 276 Greaves, C., 621 Green, S. M., 461 Greenbaum, P. E., 145, 489, 519, 540, 640 Greenberg, D. M., 688 Greenberg, M., 485 Greene, M. I., 213 Greene, R. L., 552 Greenfeld, L., 27

Greening, L., 145 Greening, S. G., 384, 724 Greenwald, A. G., 621 Greenwood, A., 513, 699, 710 Gregg, T. R., 409 Gregory, S., 54, 382, 402, 403 Greif, J. L., 135 Gremore, T. M., 232, 512 Gretton, H. M., 486, 496, 513, 618, 625, 673, 688, 693, 694, 696 Griffin, A., 574 Griffith, J. W., 135 Griffiths, A., 190, 191, 192, 196 Grigoryan, G. A., 394 Grillon, C., 98 Grimes, R. D., 370, 482, 496, 715, 738 Grimm, J., 462 Grisso, T., 39, 47, 55, 147, 483, 486, 511, 690, 691, 694 Groer, M. W., 152 Gross, J. J., 99, 409 Gross, J. N., 462 Grotpeter, J. K., 457, 515, 690 Grove, W. M., 179, 212, 213, 249, 327 Grüsser, S. M., 645 Gu, D., 712, 738 Guarnera, L. A., 57, 686, 736 Guarraci, S. M., 15 Guastella, A. J., 151, 346, 406, 439, 466, 493. 553 Guay, J. P., 45, 47, 356, 573, 590, 662, 663, 664, 665, 666, 667, 668, 670, 674, 738 Gudonis, L., 45, 643, 650 Guenther, W., 88 Gumpert, C. H., 639 Gunderson, J. G., 286, 287, 288, 300 Gunter, T. D., 393, 647 Guo, G., 341 Gupta, S., 343 Gustafson, S. B., 146, 551, 590, 595, 599.693 Guy, L. S., 39, 45, 55, 56, 57, 689, 690, 691, 695, 698, 699, 733, 740, 743, 745 Guze, S. B., 517 Gynther, M. D., 219 Gyurak, A., 409 Ha, T. M., 342 Haan, N., 484 Haapasalo, J., 359, 363, 364 Haas, S. M., 496 Habekost, T., 638 Habermann, N., 673 Habermeyer, E., 46, 59, 532, 533, 536, 542, 612 Haberstick, B. C., 342 Habeych, M., 644 Hadjicharalambous, M. Z., 156 Haertzen, C. A., 220 Hagman, B., 146 Hahn, R. A., 372 Haines, J. L., 343 Hajal, N. J., 386, 410 Hajcak, G., 17, 772 Häkkänen-Nyholm, H., 42, 58, 673 Hakstian, A. R., 31, 41, 100, 218, 288, 302, 511, 536, 577

Hakstian, R., 41 Halamandaris, P. V., 135 Halari, R., 413 Hald, G. M., 668 Hale, L. R., 551 Hall, C. S., 668 Hall, G. P., 364 Hall, J., 14, 156, 424 Hall, J. R., 13, 14, 16, 36, 54, 103, 127, 131, 136, 137, 148, 166, 168, 171, 178, 235, 239, 245, 246, 249, 286, 291, 292, 303, 304, 327, 388, 423, 433, 443, 447, 554, 585, 588, 596, 598, 637, 640, 646, 673, 756, 767 Hall, S. M., 515 Halperin, J. M., 461, 644 Hamburger, M. E., 512, 517 Hamer, D., 341, 647 Hamilton, J., 743 Hamilton, R. B., 50, 51, 80, 407, 428, 492, 555, 671 Hamilton, R. K. B., 50, 51, 85, 88, 89 Hammond, M., 371 Hampton, A. S., 595 Han, J., 221 Han, T., 384, 724 Hancock, J., 612, 622 Haney, C., 28 Haney-Caron, E., 402 Hanley, J. H., 372 Hansen, D. J., 363 Hanson, K., 684 Hanson, R. K., 57, 666, 667, 688, 718 Hao, W., 342 Happé, F., 151, 403 Harabasz, J., 305 Harari, M., 165, 166, 178, 181 Harbeson, C. L., 589 Harden, K. P., 726 Hare, R. D., 3, 6, 9, 31, 34, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 80, 83, 84, 89, 100, 101, 131, 132, 145, 146, 147, 167, 168, 169, 171, 175, 177, 179, 200, 201, 202, 206, 212, 213, 214, 215, 216, 217, 218, 219, 220, 224, 225, 230, 247, 249, 259, 264, 266, 270, 275, 276, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 298, 299, 301, 302, 303, 304, 336, 339, 340, 342, 354, 355, 356, 381, 390, 423, 424, 432, 436, 438, 456, 461, 463, 467, 479, 480, 481, 482, 483, 486, 487, 488, 494, 496, 497, 498, 509, 510, 511, 512, 513, 520, 529, 531, 532, 533, 535, 536, 538, 540, 541, 543, 550, 551, 552, 553, 554, 557, 573, 574, 575, 576, 577, 578, 580, 585, 587, 588, 589, 590, 593, 594, 595, 596, 611, 612, 613, 614, 615, 618, 619, 620, 621, 622, 625, 626, 636, 637, 638, 639, 640, 641, 644, 645, 662, 664, 665, 668, 670, 673, 682, 683, 685, 686, 687, 688, 689, 691, 693, 695, 697, 698, 701, 710, 715, 716, 717, 719, 732, 734, 735, 736, 737, 738, 740, 741, 743, 744, 745, 755, 756, 758, 760, 761, 768, 769 Harenski, C., 406, 408, 440, 764 Harenski, K. A., 406

Hariri, A. R., 59, 404, 672 Harkins, L., 713 Harkness, A. R., 177, 261, 757 Harlaar, N., 644 Harlan, E. T., 644 Harmon-Jones, E., 391, 671 Harnett, L., 357 Harnish, J. D., 410, 458 Harper, C. C., 27 Harpur, T. J., 31, 51, 68, 84, 89, 100, 212, 218, 219, 224, 249, 288, 302, 336, 463, 494, 511, 520, 536, 553, 574, 577, 611, 639, 641, 643, 756 Harrington, H., 299, 460 Harris, A. J. R., 667, 688 Harris, D., 195 Harris, D. A., 665, 669 Harris, G., 612, 738 Harris, G. T., 42, 47, 50, 55, 56, 58, 363, 550, 589, 612, 617, 618, 663, 664, 670, 683, 688, 696, 698, 699, 710, 712, 713, 736, 737, 739, 741 Harris, P. L., 483 Harris, T., 572 Harrison, K. S., 639 Hart, E. L., 459, 462 Hart, S., 45, 56, 614, 738, 758 Hart, S. D., 45, 46, 47, 146, 148, 189, 196, 199, 206, 212, 215, 219, 225, 285, 286, 287, 288, 292, 336, 354, 355, 356, 372, 463, 479, 483, 496, 512, 522, 531, 535, 536, 538, 541, 550, 551, 574, 588, 617, 618, 619, 625, 639, 640, 648, 664, 682, 683, 684, 685, 686, 687, 691, 693, 697, 698, 699, 715, 732, 739, 740, 741, 742, 743, 756 Harter, S., 484 Hartmann, J., 550 Hartshorne, H., 28 Hartsough, C. S., 461 Harvey, P. D., 640 Hasin, D. S., 638, 641 Hasking, P. A., 595 Haslam, N., 250, 664 Hathaway, S. R., 170, 175, 217 Hauer, A. L., 665 Hauger, R. L., 343 Hautzinger, M., 406 Havens, L., 195 Hawes, D. J., 145, 150, 151, 152, 153, 154, 155, 406, 466, 496, 518, 540, 595, 624, 625, 700, 720, 721, 724, 762, 763 Hawes, S. W., 42, 146, 483, 487, 488, 491, 612, 618, 667, 688, 696, 737, 740, 760, 761, 763, 769 Hawk, S. S., 219 Hawkins, J. D., 368, 700, 720 Haycock, D. A., 68 Haycock, J., 621 Haynes, S. N., 215 He, S., 439 Heath, A. C., 646 Heatherton, T. F., 644, 645 Heavey, C. L., 668 Hecht, L. K., 175, 593, 614 Heerey, E. A., 276 Heiblum, N., 649

Heide, K. M., 488, 693 Heider, F., 620 Heigel, C. P., 221 Heilbrun, A. B., 595, 624 Heilbrun, K., 587, 640, 692, 695, 734, 737, 738, 742 Heilbrun, M. R., 595, 624 Heinz, A., 645, 647 Heinzen, H., 205 Heitzeg, M. M., 411 Helfgott, J. B., 745, 746 Heller, D., 262 Hellström, Å., 55, 56, 542, 626 Helmus, L., 57, 667 Hemphälä, M., 516, 538, 640, 691, 694 Hemphill, J. F., 68, 132, 224, 270, 513, 520, 538, 550, 612, 620, 639, 682, 683, 686, 688, 695, 698, 699 Henderson, C. R., 370 Henderson, D. K., 175 Hendry, M., 695 Henggeler, S. W., 372, 649, 721 Henik, A., 18 Henker, B., 134 Henn, R. A., 665 Hennig, J., 342 Henry, B., 367, 461 Henry, J., 146, 155 Herba, C. M., 405, 438, 494, 541, 764 Heritage, A. J., 596 Herjanic, M., 665 Hermann, C., 434 Hermans, E. J., 593 Herpers, P., 388, 762 Herpertz, S. C., 80, 433 Herrenkohl, T. I., 368, 700 Herrero, Ó., 536 Herrington, L. L., 539 Hershey, K., 97, 465 Hervé, H., 40, 42, 47, 613, 621, 689 Herzhoff, K., 135 Hess, T. H., 512, 517 Hesse, M., 638 Hesselbrock, V. M., 645 Hewitt, J. K., 104, 129, 431, 646 Heyde, B., 269 Heyman, R. E., 614 Hiatt, K. D., 85, 386, 403 Hiatt Racer, K., 50, 88 Hickey, E. W., 16, 443, 446, 570, 571, 572, 574, 576, 580 Hickey, N., 720 Hicklin, J., 599 Hicks, A., 283 Hicks, B. M., 9, 10, 13, 14, 16, 34, 35, 36, 43, 64, 100, 101, 102, 103, 130, 135, 137, 147, 167, 171, 175, 198, 231, 245, 250, 269, 270, 285, 297, 298, 302, 303, 311, 321, 324, 325, 327, 344, 346, 354, 423, 424, 425, 429, 431, 437, 442, 443, 445, 447, 448, 511, 513, 516, 517, 536, 551, 587, 588, 596, 597, 613, 620, 623, 637, 639, 641, 645, 646, 671, 696, 697, 717, 718 Hicks, M., 625 Hicks, M. M., 691, 692, 693 Higgins, D. M., 263 Higgs, T., 45

### Author Index

Hildebrand, M., 536, 541, 543, 544, 550, 552, 688, 696, 699, 715 Hill, A., 673 Hill, C., 59, 62, 63 Hill, K. G., 368, 700 Hill, N., 463, 486 Hill, N. L., 540 Hill, P. F., 650 Hill, S. Y., 648 Hillege, S., 45, 489, 547, 550, 640 Hillyard, S. A., 86, 90 Hilterman, E. B., 719 Hilton, N. Z., 50, 589, 617, 664, 688, 689 Hilts, M., 571, 572, 574 Hindelang, M. J., 595 Hinrichs, G., 313, 320, 486, 620 Hinshaw, S. P., 459, 461, 462, 463 Hipwell, A., 458, 466, 550, 762, 763 Hirata, Y., 495 Hirono, N., 383, 390, 392 Hirsch, J., 645 Hirschi, T., 594, 595, 643, 672 Hirst, A., 86 Ho, H., 667 Hobson, J., 533, 534, 536, 715, 717 Hodges, H., 394, 735 Hodgins, S., 54, 393, 489, 496, 538, 540, 555, 613, 691, 693, 694, 695 Hodsoll, S., 151 Hoek, H. W., 392 Hoet, J. J., 393 Hof, D. D., 638 Hoff, H. A., 205, 206, 290, 531, 734 Hoffman, M. B., 80 Hofmann, S. G., 648 Hofvander, B., 695 Hogben, M., 512 Hoge, R. D., 683, 711, 741 Hogue, T. E., 699 Holden, R. R., 177, 216 Holi, M., 152 Holland, T. R., 595 Hollerbach, P., 46 Hollin, C., 713 Hollweg, M., 550 Holmes, A., 342 Holmes, J., 341 Holmes, K. N., 668 Holmes, R. M., 570, 571, 574 Holmes, S. T., 570, 574 Holt, S. E., 619, 673 Holtzworth-Munroe, A., 617, 688 Holzinger, K. J., 637 Homaifar, B. Y., 626 Homewood, J., 59, 61, 225, 593 Hommer, D. W., 411, 672 Hooghe, A., 535 Hopko, D. R., 594 Hopley, A. A. B., 636 Hoppenbrouwers, S. S., 50, 51, 52 Hopwood, C. J., 174, 264 Hornsveld, R. H. J., 59 Horton, R. S., 484 Horwood, L. J., 365 Hoshino-Browne, E., 484 Houchens, P., 696 Hough, L. M., 178 Houghton, R. E., 617, 688

Houlding, C., 694 Hourigan, D., 666 House, T. H., 406 Houston, R. J., 457, 599, 616 Howard, M. O., 145, 147, 319, 321, 487, 488, 489, 696 Howard, R., 545 Howe, J., 597 Howell, J. C., 719 Howell, T. M., 668 Howes, O. D., 426 Howland, E. W., 83 Hoyle, R. H., 176, 263, 550, 640 Hsu, Y., 483 Hu, S., 647 Huang, Y., 645 Huang, Y. Y., 342 Huang-Pollock, C. L., 86 Hubbard, J. A., 458 Huchzermeier, C., 59, 205, 542, 552, 620 Hucker, S. J., 619, 670 Huebner, B., 402 Huesmann, L. R., 457 Hughes, M. A., 593 Huizinga, D., 342, 364, 367, 368 Humayun, S., 595 Humble, K., 542, 551 Hundleby, J. D., 217, 247 Hung, A. Y., 151, 405, 494 Hunnicutt-Ferguson, K., 84 Hunt, E., 156, 269 Hunt, M. K., 594 Hunter, E. E., 599 Hunter, J. A., 696 Hunter, M., 41 Hurducas, C. C., 39, 47, 55 Hurley, W., 515 Huss, M. T., 688, 689 Hutchison, H. C., 167 Hutchison, K. E., 644, 645, 649 Hutton, E. L., 625 Hutz, M. H., 647 Hwang, S., 50, 151, 401, 408, 414, 425, 493, 756, 769 Hyatt, C. J., 402 Hyatt, C. S., 228, 229, 240, 241, 242, 243, 244, 270, 447, 621 Hyde, L. W., 59, 149, 153, 154, 404, 531, 672, 720, 721, 723, 724, 761, 762 Hyland, P., 63, 225 Hyman, S. E., 427 Iacono, W. G., 7, 8, 9, 11, 12, 17, 29, 33, 34, 37, 52, 97, 101, 103, 128, 135, 149, 167, 168, 231, 232, 245, 269, 302, 303, 325, 336, 338, 344, 346, 363, 423, 433, 495, 497, 517, 587, 588, 596, 597, 637, 640, 641, 642, 646, 741, 760, 771 Ilies, R., 263 Ingham, H., 214 Insel, T., 168, 642 Intoccia, V., 55 Intrator, J., 80, 382, 383, 387 Ireland, T. O., 365 Isen, J., 152, 494 Ishikawa, S. S., 388, 587, 595, 596, 613, 624

Ismail, G., 55, 56 Isoma, Z., 551 Israel, A. C., 177, 281 Israel, S., 135 Itti, L., 86 Iyer, S. P., 109 Jaber, M., 341 Jackson, C., 589 Jackson, D. N., 9 Jackson, H. J., 512, 513 Jackson, J. J., 263 Jackson, M. L., 715 Jackson, R., 59 Jackson, R. L., 59, 197, 512, 556, 639, 690, 691, 692, 744 Jacobs, B., 371 Jacobs, D., 512 Jacobs, G., 96 Jacobs, J. L., 638 Jacobs, W. J., 589 Jacobson, K., 649 Jacobson, K. C., 595 Jacques-Tiura, A. J., 612, 669, 670 Jaffee, S. R., 37 Jahng, S., 638 Jakobwitz, S., 593 Jam, Y., 532 Jambrak, J., 151, 406 James, L. R., 176 James, R., 664 James, W., 180 Jamison, K. R., 586 Jamner, L. D., 134 Jang, K. L., 646 Janila, M. R., 371 Janke, C., 686, 736 Jansen, E. D., 764 Janus, S., 734 Jariko, G. A., 532 Jarrett, M., 485 Jaser, R., 550 Javdani, S., 516, 517, 518, 522, 529 Jeandarme, I., 736, 737 Jelicic, M., 152 Jenkins, P., 571 Jennings, W. G., 356, 373 Jenuwein, T., 95 Jeon, D., 405 Jernigan, K., 648 Jesus, S. N., 538 Jewell, J., 232 Jewkes, R., 669 Jhatial, A. A., 532, 545 Jiang, W., 381, 387 Johansen, J., 625 Johansson, A., 343 Johansson, P., 52, 64, 68, 102, 312, 324, 445, 595, 623, 718 Johansson, P. J., 40, 41, 47, 51, 52, 59, 65 Johansson, P. T., 179, 290, 536 John, E. R., 645 John, O. P., 202, 225, 261, 262, 263, 424 John, S. L., 356, 590, 665 Johnson, D. W., 148, 215, 685, 736, 743 Johnson, E., 638 Johnson, E. O., 646

Johnson, F., 519 Johnson, G. M., 668, 670 Johnson, J., 685, 686, 736, 743 Johnson, J. A., 245 Johnson, J. K., 215 Johnson, L. B., 30 Johnson, R., Jr., 645 Johnson, T., 718 Johnson-Bilder, A., 402 Johnston, S. J., 431 Johnston, W. A., 86 Johnstone, L., 206, 484 Joiner, T. E., 8, 13, 302, 355, 447, 519, 551, 593, 620 Joiner, T. E., Jr., 134 Joiner, T. J., 17 Joiner, T. T., 10, 442, 516 Jolliffe, D., 366 Jonason, P. K., 220, 484, 589, 600, 670 Jones, A., 541, 546, 555 Jones, A. P., 145, 151, 405, 408, 438, 494, 495, 764 Jones, D. N., 68, 251, 593, 594, 596, 669 Jones, K. A., 648 Jones, L., 437, 664 Jones, S., 16, 216, 220, 248, 251, 463, 468, 482, 487, 593 Jones, S. E., 213, 242, 243, 244, 248, 263, 269, 512, 587 Jones, S. R., 341 Jordan, B. K., 515 Jordan, C. H., 484 Jordan, P., 167 Jorm, A. F., 341 Joshi, A. A., 383, 393 Joshua, S., 283 Jouriles, E. N., 496, 762 Joy, M. E., 114, 169 Joyal, C., 672 Juby, H., 365 Judd, C. M., 692 Judge, T. A., 262, 263 Jung, C. G., 3, 531 Juodis, M., 494, 554, 617 Jüriloo, A., 59 Justus, A. N., 433, 520 Jusyte, A., 406 Jutai, J., 573, 611 Kadden, R. M., 336 Kadlec, K. M., 669 Kahn, R. E., 11, 45, 144, 146, 152, 298, 318, 321, 324, 424, 464, 465, 467, 480, 498, 550, 574, 598, 625, 693, 719, 743, 757, 763 Kahneman, D., 86, 98, 106 Kalb, L. M., 355, 366 Kalichman, S. C., 665 Kaloupek, D. G., 135 Kamphaus, R. W., 148 Kandel, E. R., 645 Kant, I., 181 Kapinos, T., 591 Kaplan, K. K., 641 Kaplan, S., 693 Kaprio, J., 646 Kapur, S., 426 Karalunas, S. L., 109

Karnath, H. O., 764, 765 Karoly, H. C., 644, 645 Karpman, B., 6, 15, 16, 40, 49, 118, 134, 170, 200, 220, 221, 260, 266, 300, 424, 480, 588, 623, 696, 718, 755, 756 Kastner, R. M., 176, 234, 246, 670 Kastner, S., 405 Katzenmeyer, C., 217 Kaukiainen, A., 457, 515 Kavanagh, P., 589, 600 Kavi, V., 341 Kavoussi, R. J., 341, 343, 345 Kaye, J. T., 447 Kazdin, A. E., 177, 249, 371, 482 Kazemian, L., 363 Keane, T. M., 135 Keilen, A., 740 Kelley, M. L., 370 Kelley, S., 687 Kelley, S. E., 42, 180, 701, 732, 744, 746 Kelly, G., 214 Kelly, J. C., 618 Kelly, M. R., 719 Keltner, D., 276 Kendler, K. S., 129, 130, 282, 285, 340, 343, 641, 649 Kendrick, D., 212 Kenemans, J. L., 86 Kennair, L. O., 485 Kennealy, P. J., 146, 511, 513, 514, 553, 639, 650, 667, 695, 717, 740 Kennedy, D. P., 403, 443 Kennedy, J. L., 495 Kennedy, W. A., 487, 537, 625 Kenny, D. A., 692 Kent, T. A., 614 Kentle, R. L., 424 Kerig, K. P., 484 Kerlin, K., 145, 494, 553 Kernberg, O. F., 287, 288, 718 Kerns, J. G., 645 Kerr, M., 9, 64, 102, 132, 146, 153, 172, 266, 313, 324, 338, 363, 368, 370, 382, 423, 445, 480, 518, 551, 595, 623, 640, 693, 718, 720 Kessler, R. C., 638 Keysers, C., 85, 407, 440, 765 Khan, R., 589, 669 Khanna, A., 619 Khattar, N. A., 621 Khiroya, R., 47 Kiehl, K. A., 39, 45, 47, 50, 54, 58, 61, 80, 84, 89, 152, 171, 220, 266, 320, 381, 382, 384, 385, 387, 401, 402, 405, 406, 407, 408, 411, 423, 440, 441, 586, 587, 613, 615, 644, 645, 649, 665, 669, 672, 764, 765 Kilgour, T. G., 716 Killcross, S., 250, 426, 466 Killian, A. L., 484 Kim, C. H., 342 Kim, H., 536 Kim, H. M., 394 Kim, J. J., 667 Kim, S., 113, 484 Kimble, M., 621 Kim-Cohen, J., 342, 515 Kimmel, R., 765

Kimonis, E. R., 10, 11, 50, 58, 111, 134, 144, 145, 146, 148, 151, 152, 153, 155, 156, 317, 318, 319, 321, 324, 359, 364, 424, 428, 443, 458, 464, 465, 467, 468, 482, 486, 490, 494, 496, 512, 514, 539, 540, 548, 549, 551, 554, 557, 581, 597, 623, 625, 686, 693, 696, 697, 700, 719, 720, 736, 763 King, C. A., 484 King, S., 492 Kingston, D. A., 667, 688 Kinner, S., 588 Kirby, J. N., 371 Kirisci, L., 644 Kirkpatrick, J. T., 718 Kirsch, L. G., 621, 673 Kissin, B., 645 Kitzman, H., 371 Kiyonari, T., 597 Kjærgaard, A., 598 Klaver, J. R., 148, 196, 538, 664 Klein, L., 136 Klein, R. G., 460 Kleinschmidt, A., 402, 408 Klepfisz, G., 667 Kline, M., 589 Kline, S., 27 Kline, S. M., 148, 364, 686, 736 Kling, J. K., 220 Klinger, M. R., 550 Klingzell, I., 12, 761 Klinnert, M. D., 405 Klosko, J., 716 Knafo, A., 485 Knievel, R. C., 167 Knight, K., 648 Knight, R. A., 9, 45, 47, 356, 573, 590, 619, 662, 663, 664, 665, 666, 667, 668, 670, 671, 673, 674, 695, 738, 740 Knight, R. F., 636 Knight, R. T., 276 Knowles, E. S., 41 Knutson, B., 410, 411, 412, 413 Knutson, N., 113 Ko, C. H. E., 176 Ko, H.-C., 647 Koch, J. L., 4 Kochanska, G., 11, 12, 113, 114, 115, 153, 154, 169, 390, 436, 462, 465, 466, 484, 485, 644, 760 Koegl, C. J., 357 Koenig, J. L., 484 Koenigs, M., 54, 89, 381, 385, 403, 406, 411, 644, 645 Kofler, M., 445, 485 Koh, K. B., 342 Kohl, K., 642 Köhler, D., 59, 205, 313, 320, 486, 620 Koivisto, H., 363, 364 Kok, A., 86 Kola, S., 63, 225 Kolar, G. P., 589 Kolin, E. A., 217 Kolko, D. J., 154, 496, 720, 723, 724, 762 Kolla, N. J., 54, 623 Koller, G., 647 Kolvin, I., 364 Kolvin, P., 364

Kongerslev, M., 42 Koob, G. F., 759 Koopmans, J. R., 646 Koot, H. M., 466, 762 Koposov, R. A., 540 Korebrits, A., 538 Korhonen, T., 134 Kosmyna, R., 595 Koss, M. P., 668 Kosslyn, S. M., 387 Kosson, D. S., 42, 46, 47, 50, 54, 59, 80, 83, 146, 190, 196, 206, 217, 313, 314, 321, 324, 342, 438, 463, 467, 482, 486, 487, 511, 521, 529, 532, 534, 535, 537, 538, 540, 550, 551, 553, 555, 556, 557, 593, 594, 595, 597, 612, 614, 618, 625, 639, 640, 691, 692, 693, 697, 719, 741, 760, 761 Kotler, J. S., 145, 465, 487, 488, 489, 693, 763 Kotov, R., 18, 263, 289, 424, 641, 664 Kozak, M. J., 17, 759, 769 Kraepelin, E., 4 Krafft-Ebing, R. V., 618 Kramer, J. H., 390 Kramer, M., 14, 303, 426 Kramer, M. D., 10, 13, 95, 101, 102, 130, 131, 135, 175, 219, 235, 291, 433, 434, 436, 598, 635, 637, 638, 642 Kramp, P., 538 Kraut, R. E., 484 Krauter, K. S., 104, 129, 431, 646 Krebs, A., 408 Kreis, M. F., 690 Kreis, M. K., 518, 521, 522, 531 Kreis, M. K. F., 197, 205, 206, 290 Krettenauer, T., 484 Krieg, A., 458 Krieger, F. V., 481 Krioukova, M., 232 Krischer, M. K., 364, 516, 519 Kristiansson, M., 639 Kristic, S., 67 Kristol, I., 27 Kroger, R. O., 213 Krohn, M. D., 364 Kroneman, L. M., 466, 762 Kroner, D. G., 618, 640, 713, 725 Kropp, P. R., 617, 683, 684, 689 Krueger, R. F., 7, 8, 10, 11, 13, 14, 16, 25, 33, 34, 43, 53, 54, 64, 95, 97, 100, 101, 102, 104, 110, 115, 129, 130, 131, 133, 134, 135, 147, 165, 167, 170, 175, 219, 224, 231, 235, 245, 246, 261, 264, 266, 269, 270, 284, 285, 288, 289, 290, 291, 298, 299, 302, 303, 311, 321, 325, 338, 346, 414, 422, 424, 426, 429, 431, 433, 437, 445, 446, 481, 513, 517, 519, 536, 551, 573, 587, 588, 592, 597, 598, 613, 615, 635, 637, 641, 642, 644, 645, 646, 650, 671, 673, 697, 698, 715, 717, 721, 742, 756, 757, 758, 767, 769 Kruepke, M., 406, 644 Kruesi, M. J., 342 Kruh, I. P., 458, 464, 465 Krupp, D. B., 663 Krusei, M. J. P, 402 Kubak, F. A., 51, 550

Kubany, E. S., 215 Kucharski, L. T., 216 Kuhnen, C. M., 410, 411, 412, 413 Kullgren, G., 553, 695 Kumari, V., 383, 385, 392 Kumka, G., 625, 673, 688 Kumsta, R., 150, 156, 468 Kunce, J. T., 665 Kunz, C., 206, 531, 626, 698 Kunzel, E., 406 Kupersmidt, J., 368 Kupfer, D. J., 281 Kuruoglu, A. C., 381, 392 Kurzban, R., 50, 589 Kusaj, C., 39, 733 Kwako, L. E., 759 Kweon, Y. S., 342 Kyranides, M. N., 443, 446, 549, 554, 538 Laajasalo, T., 533, 544 Laakso, A., 648 Laakso, M. P., 382, 384, 387, 392 LaBrode, R. T., 574, 576, 577 LaCasse, L., 381, 382, 383, 388, 587, 613, 644 Ladyshewsky, R., 588 Lagerspetz, K. M. J., 457, 515 Lahey, B. B., 149, 151, 263, 341, 346, 406, 440, 459, 460, 462, 463, 465, 480, 482, 498, 686, 741 Lally, S. J., 47, 55 Lalumière, M., 363 Lalumière, M. L., 50, 69, 589, 621, 663, 664 Lamb, D., 512 Lambert, N. M., 461 Lambert, P. L., 512, 690 Lambert, S., 366 Lamkin, J., 54, 424 Lamm, C., 88, 405, 406 Lammers, S., 544 Landes, R. D., 650 Landfeld, K., 756 Landfield, K. E., 638 Landt, O., 342 Lane, S. D., 626 Lane, S. P., 63 Lang, A. R., 9, 10, 102, 290, 302, 429, 434, 588, 636, 639, 650, 717 Lang, C., 741 Lang, P. J., 80, 101, 276, 425, 432, 433, 434, 439, 447, 520, 554 Lang, S., 363, 542 Langhinrichsen-Rohling, J., 688, 689 Langstrom, N., 540, 547, 553, 688, 695 Langton, C. M., 688, 713 LaPierre, D., 555 LaPrairie, J. L., 12, 50, 96, 168, 291 Larson, C. L., 84, 381, 384, 408, 427 Larsson, H., 50, 58, 149, 338, 339, 346, 489, 491, 540, 595, 646, 771 Larzelere, R. E., 370 Lasenby, J., 485 Latessa, E., 715 Latzman, N. E., 468, 482 Latzman, R. D., 10, 54, 165, 166, 168, 173, 175, 176, 230, 245, 263, 426, 468, 482, 576, 589, 593, 614, 769

Lau, K. S. L., 484 Laubacher, A., 532 Laurell, J., 542, 626 Laurens, K. R., 405, 438, 494, 541, 645, 764 Laurinavičius, A., 59, 536 Lavie, N., 86, 151 Law, M., 684 Lawing, K., 458, 464, 465, 721 Lawrence, A. D., 405 Lazarou, C., 551 Le Foll, B., 648 Le Strat, Y., 648 Leal, S., 196 LeBlanc, M., 666 LeBreton, J. M., 612, 669, 670 LeDoux, J. E., 168, 405, 425, 428 Lee, J.-F., 647 Lee, K., 245, 483, 760 Lee, L., 391 Lee, R., 626 Lee, S. H., 35, 344 Lee, S. S., 492, 497 Lee, T. M., 387 Lee, T. M. C., 410 Lee, Y., 425 Lee, Y. J., 342 Lee, Z., 148, 196, 316, 321, 324, 538, 539, 664 Lefkowitz, M. M., 457 Lehmkuhl, G., 516 Leibenluft, E., 481, 672 Leistico, A.-M. R., 39, 62, 144, 285, 355, 495, 540, 589, 640, 667, 683, 684, 685, 686, 687, 689, 690, 691, 692, 693 Leistico, A. R., 45, 100, 456, 457, 464, 482, 483, 488, 550, 612 Lejuez, C. W., 594 Lemieux, L., 384 Lemonick, M. D., 26 Lencz, T., 382, 386, 388, 389, 391, 392, 587, 613, 644 Lent, R. W., 590 Lenzenweger, M. F., 97, 718 Leon, G. R., 598 Leonard, A., 593 Leong, G. B., 574 Leschied, A., 357, 358 Leshner, A. I., 97 Lester, W., 225, 230, 249 Lester, W. S., 221, 511, 513 Leukefeld, C., 13, 58, 132, 170, 263, 290, 424, 590, 643 Leung, K., 537 Levander, S., 9, 46, 132, 172, 266, 338, 382, 423, 480, 518, 538, 544, 640, 691 Levenson, M., 266, 270, 320 Levenson, M. R., 171, 220, 221, 222, 223, 384, 423, 615, 669 Levenston, G. K., 80, 363, 432, 434, 458, 520, 554 Levi, M., 595 Levin, J., 570, 571, 572, 573, 574 Levine, D. S., 88 Levy, K. N., 718 Levy-Elkon, A., 693 Lewinsohn, P. M., 281 Lewis, J., 52

Lewis, K., 312, 324, 618, 699, 712, 714, 718, 738 Lewis, M., 483 Leygraf, N., 733, 739 Li, N. P., 589, 670 Li, Y., 597 Liao, J., 381 Libben, M., 622 Libby, J., 550 Lichtenstein, P., 50, 149, 336, 338, 339, 491, 646, 771 Lickley, R. A., 441 Liddle, P. F., 644, 645 Lidz, C. W., 719, 743 Lidz, V., 640 Lieberman, M. D., 342 Liebman, M. J., 614 Lieving, L. M., 626 Lilienfeld, S. O., 9, 10, 12, 13, 34, 45, 50, 54, 68, 69, 84, 88, 96, 100, 101, 128, 131, 147, 151, 165, 166, 167, 168, 169, 170, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 190, 200, 211, 212, 213, 214, 215, 216, 217, 218, 220, 224, 225, 230, 231, 232, 233, 234, 235, 245, 248, 250, 263, 266, 276, 281, 282, 284, 287, 291, 292, 298, 301, 302, 312, 321, 338, 340, 346, 363, 384, 406, 413, 423, 426, 428, 431, 432, 434, 445, 446, 461, 467, 468, 480, 482, 483, 510, 512, 515, 517, 535, 540, 551, 576, 585, 586, 589, 591, 592, 593, 595, 596, 597, 598, 599, 614, 615, 616, 617, 625, 637, 638, 641, 663, 665, 685, 690, 696, 697, 701, 712, 738, 742, 755, 756, 758, 765, 769 Lillebaek, T., 538 Lim, E. W., 484 Lim, J. Y., 484 Lima, E. N., 152, 518 Lin, C.-H., 647 Lin, M. H., 462 Lin, W.-W., 647 Linares, D., 146, 763 Lind, P. A., 343 Lindberg, N., 152, 673 Linden, D. E. J., 429 Linden, W., 512 Lindhorst, T. P., 669 Lindner, R. M., 8 Lindsay, R. C. L., 760 Lindsay, W. R., 699 Linnoila, M., 518 Linsz, N. L., 213 Linz, D., 668 Lipsey, M. W., 358, 368, 719, 724 Lissek, S., 447 Litschge, C. L., 147 Litt, M. D., 336 Litten, R. Z., 759 Little, T. D., 457, 458, 684 Littlefield, A. K., 8, 47, 289, 516, 635, 641, 643 Liu, H., 381 Liu, J., 392, 393, 674 Liu, T. L., 410 Liu, X., 410, 412, 413 Livesley, W. J., 9, 48, 199, 200, 207, 288, 645.646

Lizotte, A. J., 364 Lloyd, C. D., 57, 733 Lochman, J. E., 149, 151, 368, 373, 410, 458, 467, 488, 490, 514, 540, 613, 724, 761, 762 Lockwood, P. L., 61, 151, 406, 407, 408, 440, 441, 442, 446, 765 Lodewijks, H., 483 Loeber, R., 39, 61, 68, 144, 147, 149, 152, 355, 359, 365, 366, 367, 368, 370, 385, 390, 458, 459, 461, 462, 466, 480, 481, 488, 490, 492, 515, 538, 613, 639, 688, 692, 700, 741, 761, 762, 763, 766, 769, 771 Loehlin, J. C., 337 Loevinger, J., 481, 756 Logan, C., 172, 189, 190, 191, 192, 193, 194, 197, 198, 205, 206, 230, 290, 292, 310, 321, 516, 518, 531, 532, 534, 552, 623, 639, 697, 715, 742 Logan, M. H., 573 Logothetis, N. K., 764 Lohr, B. A., 664 Lolait, S. J., 342 Loney, B. R., 51, 145, 149, 151, 152, 291, 338, 464, 467, 482, 492, 494, 512, 518, 540, 553, 557, 640, 664, 741 Long, J. D., 147, 490, 761 Lonsway, K. A., 669 Looman, J., 55, 56, 695, 713 LoParo, D., 50, 58, 335, 343, 425, 491, 646, 762 Lopez, M. L., 535 López, R., 13, 132, 168, 178, 235, 267, 273, 424, 435, 538 Lopez-Duran, N. L., 386, 410 Loranger, A. W., 619 Lorber, M. F., 136, 169 Lord, J., 640 Lord, S., 669 Lordos, A., 46, 529, 691 Lorenz, A. R., 54, 83, 84, 85, 249, 520, 540, 553, 557 Lösel, F., 355, 725 Lotta, T., 647 Lotze, M., 594 Loucks, A. D., 512, 690 Louden, J. E., 64, 102, 623, 718 Louth, S. M., 512, 513 Lovegrove, P. J., 366 Low, H., 518 Low, M. J., 341 Lowenkamp, C., 715 Lozano, D. I., 554 Lozier, L. M., 151, 405, 408, 464, 466, 764 Lozoya, E., 59 Lu, L., 648 Lu, Q., 648 Lu, R.-B., 342, 647 Lubke, G. H., 305, 309 Luborsky, L., 637 Lucente, S. W., 514, 648, 686, 715 Luck, S. J., 86, 90 Lucy, M., 54, 134, 264 Lucy, M. D., 758 Ludmer, M., 589 Luft, J., 214, 248

Lukowitsky, M. R., 287 Luna, E., 58 Lung, F.-W., 647 Luntz, B. K., 363 Luo, Q., 405 Lushing, J., 50, 586 Lussier, P., 666 Luu, P., 645 Ly, M., 383, 402, 403, 672 Lykken, D. T., 6, 11, 22, 23, 24, 25, 26, 27, 29, 30, 33, 34, 35, 36, 37, 40, 49, 80, 83, 94, 101, 103, 134, 165, 167, 169, 170, 172, 173, 175, 179, 205, 217, 219, 220, 221, 276, 290, 291, 300, 302, 336, 345, 422, 431, 432, 434, 436, 439, 559, 585, 591, 594, 595, 621 Lynam, D. R., 10, 13, 16, 39, 40, 45, 47, 48, 49, 52, 53, 54, 58, 63, 68, 100, 110, 111, 132, 144, 149, 156, 157, 166, 167, 169, 170, 171, 172, 175, 176, 177, 178, 179, 180, 213, 220, 221, 222, 223, 225, 232, 233, 234, 239, 240, 241, 242, 243, 244, 245, 247, 248, 250, 251, 259, 262, 263, 264, 265, 266, 267, 269, 270, 271, 273, 274, 275, 284, 287, 288, 289, 290, 291, 292, 298, 302, 303, 307, 309, 326, 339, 355, 359, 364, 367, 369, 372, 393, 424, 431, 443, 457, 461, 479, 480, 486, 488, 490, 513, 515, 538, 550, 551, 552, 573, 587, 590, 591, 593, 594, 596, 597, 598, 599, 624, 625, 639, 640, 641, 643, 685, 687, 688, 692, 694, 697, 698, 700, 715, 741, 756, 758, 759, 761 Lyndon, A. E., 669 Lynn, R., 536 Lynskey, M. T., 646 Lyon, D., 42 Lyon, D. R., 193, 682, 732, 734, 735, 740 Lyons, M., 484 Lytton, H., 369, 370 MacCoon, D. G., 66, 88, 89, 520 MacCulloch, M. J., 621, 689 MacDonald, A. W., III, 427 MacDonald, G. M., 372 MacDougall, E., 221 MacDougall, E. A. M., 741 Machamer, P., 86 Machin, D., 290, 496 Mack, S. M., 194 MacKillop, J., 54, 170, 264, 758 Mackinnon, A., 341 MacNeil, B. M., 216 Madan, A., 647 Maden, T., 47 Madhav, N. V., 393 Madras, B. K., 341 Maesschalck, C., 535 Magaletta, P. R., 221, 590, 665 Mager, K. L., 62, 514, 689 Magidson, J., 64 Magnusson, D., 461 Magyar, M. S., 312, 321, 742, 743, 745, 746 Maher, B., 646 Mahmut, M. K., 59, 61, 225, 228, 229, 593 Mailloux, D. L., 625, 640, 665

## Author Index

Malamuth, N. M., 663, 668, 696 Malcolm, P. B., 619, 665 Malik, A. I., 150, 343 Malinosky-Rummell, R., 363 Malone, S. M., 12, 103, 128, 346, 347, 495 Malouff, J. M., 263, 641 Malterer, M. B., 66, 68, 168, 174, 231, 234, 291, 671 Malti, T., 484 Maltzman, I., 424, 434 Manchak, S., 616, 712, 719, 738, 743 Manchester, W., 30 Manders, W. A., 372, 720, 721, 722 Mandracchia, J. T., 621 Mann, J. J., 647 Mann, R. E., 667, 668, 718, 725 Mann, S., 196 Mannheim, G., 402 Männistö, P. T., 647 Manolio, T. A., 344 Manson, J. H., 589 Manti, E., 547, 549, 551 Manuck, S. B., 342, 519, 647, 672 Maples, J. L., 54, 170, 176, 177, 240, 264, 270, 447, 621, 758 Maples-Keller, J. L., 54, 424 Maraun, M. D., 199, 200 Marchewka, A., 387 Marcus, D. K., 9, 45, 147, 168, 171, 172, 174, 175, 176, 177, 178, 179, 231, 233, 234, 251, 356, 590, 597, 615, 664, 665, 697, 698, 719, 738, 740 Marczyk, G., 587 Marini, V. A., 458, 492 Marion, B. E., 216, 224, 248, 512, 513 Markie-Dadds, C., 371 Markon, K. E., 14, 16, 53, 64, 95, 96, 97, 102, 130, 131, 170, 175, 219, 261, 263, 264, 288, 289, 298, 303, 311, 321, 424, 426, 445, 551, 598, 635, 637, 641, 642, 697 Marks, P. A., 665 Markus, H. R., 530 Marlatt, G. A., 650 Marler, C. A., 342 Maroco, J., 538, 540 Marques, F. Z. C., 647 Marquis, P., 713 Marsee, M. A., 11, 15, 50, 58, 68, 111, 131, 132, 144, 303, 424, 425, 426, 428, 431, 443, 445, 456, 457, 458, 481, 484, 488, 515, 538, 573, 574, 625, 701, 769 Marsella, A., 530 Marsh, A. A., 17, 151, 234, 384, 404, 405, 406, 407, 408, 410, 438, 440, 441, 443, 447, 464, 553, 555, 755, 764, 765, 766, 768, 770, 771 Marshall, L. A., 359, 363, 365 Marshall, P., 683, 684 Marshall, W. L., 664, 672 Martel, M. M., 107, 110 Martens, W. J. H., 600 Martin, R. A., 620 Martin, T. A., 262 Martin, W. R., 220 Martinez, J. A., 643

Martinez, M. A., 593, 614 Mash, E., 149 Massey, C., 597 Mathieu, C., 59, 62, 68, 596 Matsumoto, Y., 597 Matthews, J. S., 485 Matthys, W., 151, 405, 464, 494, 554, 724 Mattsson, A., 518 Maughan, B., 153, 156, 481, 484, 595, 769 Maurer, H. S., 648 Maxfield, M. G., 363 Maxwell, J. S., 85 May, M., 28 Mayer, A. R., 550 Mayer, S. V., 406 McAdams, D. P., 297 McAuliffe, M. D., 458 McBride, C. K., 550, 555 McBride, H. L., 625 McBride, M., 618, 673, 688 McBurnett, K., 462, 485, 625 McCahey, J. P., 69 McCarthy, D. M., 61, 643 McCarthy, K., 594 McCarthy, L., 738 McCarthy, M. I., 150, 343 McCleary, R. A., 81 McClelland, G. H., 692 McClelland, G. M., 515 McClelland, M. M., 485 McCloskey, M. S., 410, 626 McClure, E., 672 McConville, D., 693 McCord, J., 8, 16, 40, 103, 131, 132, 200, 231, 234, 260, 298, 354, 359, 365, 436, 442, 480, 573, 592 McCord, W., 8, 16, 40, 103, 131, 132, 200, 231, 234, 260, 298, 354, 436, 442, 480, 573, 592 McCormick, A., 206 McCormick, A. V., 694 McCormick, D., 738 McCormick, D. J., 715 McCoy, A. N., 405 McCoy, M. G., 482 McCoy, W., 468 McCoy, W. K., 45 McCrae, R. R., 96, 157, 172, 173, 180, 201, 216, 261, 262, 263, 275, 424, 718, 757 McCrary, K. L., 147, 190, 211, 510, 685, 742 McCrory, E. J., 54, 59, 148, 149, 339, 538, 589 McCrory, E. J. P., 468, 761, 762 McCuish, E. C., 206 McCusker, J., 517 McDaniel, M. A., 596 McDannald, M. A., 410 McDermott, B. E., 176, 325, 616, 695, 698 McDermott, P. A., 536, 537 McDonald, J. J., 84, 645 McDonald, N. M., 485 McDonald, R., 496, 762 McGee, R., 8, 25, 131, 299, 424 McGhee, J. L., 621

McGillivray, H., 622 McGovern, J., 534 McGrath, C. L., 766 McGrath, P. J., 484 McGrath, R. J., 194 McGue, M., 7, 29, 33, 34, 35, 37, 103, 128, 325, 336, 338, 344, 346, 431, 444, 637, 642, 771 McHoskey, J. W., 222, 223 McHugh, M., 135 McHugh, R. K., 648 McKay, H. D., 369 McKay, J., 715 McKay, J. R., 512, 515, 648 McKee, G., 665 McKenzie, M. E., 492, 497 McKie, S., 387 McKinley, J. C., 170, 175, 217 McKinnon, L., 550, 692, 695 McKone, E., 404, 447, 494, 554 McLachlan, K., 732, 738, 741 McLanahan, S. S., 27 McLaron, M. E., 429 McLellan, A. T., 637 McMahon, R. J., 145, 465, 484, 487, 488, 489, 693, 762, 763 McMillen, J. C., 147 McNamee, R. L., 644 McNaughton, N., 81, 88, 97, 98, 99, 100, 108, 109, 111, 671 McNeil, R. J., 369 McNiel, D., 738 McNulty, J. L., 215, 757 McNulty, T., 95, 108, 109, 426, 444 McPherson, L. E., 552 McPherson, L. M., 456 McVey, D., 716 Mealey, L., 50, 69, 301, 559, 589, 664, 696 Mednick, B. R., 366 Mednick, S. A., 12, 363, 366, 386, 390, 392, 393, 494 Meehl, P. E., 9, 136, 175, 180, 199, 200, 207, 212, 215, 245 Meeus, W., 151, 405, 464, 494, 552, 554 Meffert, H., 50, 85, 401, 405, 407, 409, 412, 425, 440, 464, 493, 495, 756, 765, 769 Mega, M. S., 383 Megargee, E. I., 510 Meier, B., 263, 276 Mejia, V. Y., 433 Mellentin, A. I., 638 Mellingen, K., 393 Mellsop, G., 283 Meloy, J. R., 40, 190, 196, 286, 287, 386, 387, 512, 619, 621, 673 Melton, G. B., 372, 740, 743 Meltzer, C. L., 597 Meltzoff, A. N., 88 Menard, K. S., 496 Menard, S., 367, 368 Mendez, M. F., 390 Menictas, C., 59, 225 Menon, M., 484 Menon, V., 645 Mercier, H., 496, 693 Merckelbach, H., 624

Messinger, D. S., 485 Mesulam, M. M., 402 Metcalfe, J., 98, 106 Meyer-Bahlburg, H. F., 518 Meyers, J. R., 695 Michael, R., 551 Michalska, K. J., 151, 406, 440 Michaud, S. G., 578, 580 Michie, C., 42, 45, 46, 47, 48, 63, 146, 147, 189, 199, 201, 202, 205, 206, 285, 290, 292, 342, 354, 356, 372, 388, 488, 511, 512, 522, 531, 535, 536, 537, 540, 613, 615, 691, 697, 715, 742 Mick, E., 647 Miczek, K. A., 342 Mikolajewski, A. J., 341 Mikulincer, M., 442 Miles, L., 98 Miller, A. K., 197, 199, 744 Miller, B. L., 390 Miller, C., 146 Miller, C. S., 148, 686, 736, 737, 743, 744 Miller, D. J., 688 Miller, E. K., 408, 426, 427, 428, 446 Miller, F. J. W., 364 Miller, G. A., 550-551, 768 Miller, J., 263 Miller, J. D., 10, 13, 40, 47, 48, 49, 54, 58, 63, 100, 132, 166, 167, 169, 170, 171, 172, 175, 176, 177, 178, 179, 180, 213, 216, 221, 225, 228, 229, 232, 233, 234, 235, 240, 241, 242, 243, 244, 245, 248, 250, 251, 259, 262, 263, 264, 265, 269, 270, 274, 275, 286, 287, 290, 291, 302, 303, 307, 309, 424, 443, 447, 457, 463, 482, 512, 513, 514, 516, 552, 573, 587, 590, 591, 593, 596, 598, 599, 614, 621, 643, 685, 687, 697, 698, 758, 759 Miller, K., 343 Miller, L. S., 372 Miller, M. B., 344, 346 Miller, M. H., 390 Miller, M. W., 135, 536 Miller, P. J., 305, 309 Miller, W. R., 650 Milligan, W. L., 406 Millon, C., 619 Millon, T., 40, 157, 202, 207, 215, 219, 282, 283, 619, 641, 718 Mills, S., 343 Millsap, R. E., 63 Mills-Koonce, W. R., 153, 494 Milnamow, M., 613 Milne, B. J., 299, 460 Miltner, W. H., 646 Mincer, J., 594, 600 Mineka, S., 129 Minzenberg, M. J., 40 Mischel, W., 28, 31, 98, 99, 106 Mishkin, F., 383 Mishra, S., 50 Mitchell, D., 80, 456, 613 Mitchell, D. G., 114, 151, 384, 406, 408, 409, 437, 464, 492, 553, 593, 724 Mitchell, G., 664 Mitchell, K. E., 213 Mitchell, K. J., 152

Mitchell-Perez, K., 45, 665, 738 Miyake, A., 136, 414, 644 Mobbs, D., 409 Modecki, K., 492 Moeller, F. G., 412 Moeller, S. K., 263 Moffitt, T. E., 7, 8, 25, 37, 50, 110, 112, 129, 131, 135, 144, 145, 155, 299, 321, 338, 359, 367, 369, 424, 459, 460, 461, 464, 468, 480, 488, 514, 515, 538, 551, 595, 597, 637, 700, 715, 741, 743, 761, 762, 771 Mohandas, K. G., 393 Mokros, A., 9, 39, 46, 47, 58, 59, 60, 61, 64, 65, 66, 100, 145, 200, 230, 249, 301, 354, 381, 487, 497, 510, 529, 536, 574, 612, 615, 618, 619, 639, 664, 670, 673, 674, 691, 710, 758 Mol, B., 595 Molenberghs, P., 622 Moltó, J., 13, 132, 168, 178, 235, 267, 273, 424, 433, 435, 533, 536, 538, 541, 544, 551, 552, 554 Momenan, R., 759 Monahan, J., 517, 595, 612, 686, 692, 695, 699, 712, 713, 725 Monahan, K. C., 148, 693 Monson, J., 493, 494 Montagne, B., 593 Montague, P. R., 427 Monuteaux, M. C., 647 Mooney, P., 699 Moore, C., 484 Moore, J. D., 432 Moore, S. C., 554 Moran, P., 468 Moran, T., 486, 494 Morana, H. C., 532, 533, 545 Morash, M., 366 Moretti, M. M., 148, 514, 515, 538 Morey, L. C., 219, 221, 232, 284, 285, 514, 685, 743 Morgan, A. B., 128, 216, 346, 413, 431, 445, 595, 756 Morgan, T. A., 642 Morphett, N. C., 695 Morrell, R., 669 Morris, A. S., 106, 112 Morris, J. S., 405 Morris, M., 621 Morrison, F. J., 485 Morrison, J., 189, 192, 195 Morrissey, C., 689, 699 Morrone-Strupinsky, J. V., 114, 249 Morrongiello, B. A., 485 Morrow, M. T., 458 Morrow, R., 622 Morse, S. J., 58, 740 Mortensen, E. L., 538 Morton, R. J., 571, 572, 574 Morton-Bourgon, K., 666, 688 Moser, J. S., 95, 103, 424, 644, 769 Motzkin, J. C., 89, 385, 402, 411, 645 Mouilso, E. R., 669 Moul, C., 150, 250, 426, 436, 439, 466 Moulder, B., 447 Moulier, V., 672

Mount, M. K., 262 Mourão-Miranda, J., 766 Mowle, E., 743 Mroczek, D., 718 Mueser, K. T., 638 Mulder, G., 86 Mulder, L. J., 86 Muldoon, M. F., 647 Müller, J. L., 382, 383, 384 Muller-Isberner, R., 534 Mullins-Nelson, J. L., 589, 597 Mullins-Sweatt, S. N., 46, 178, 286, 289, 590 Mulvaney, F. D., 648 Mulvey, E. P., 62, 463, 482, 483, 511, 595, 626, 690, 691, 695, 699, 712, 719, 740, 743, 760, 761 Munafò, M. R., 646, 648 Muncer, S., 671 Mundt, K. A., 517 Muñoz, G. J., 594 Muñoz, L. C., 145, 151, 152, 153, 155, 368, 404, 458, 490, 493, 539, 553, 589, 625, 669, 672, 693 Muñoz, R. A., 282 Müri, R. M., 427 Muris, P., 59 Murphy, B., 54, 172, 516 Murphy, C. M., 715 Murphy, D. L., 342 Murphy, F. C., 405 Murphy, G., 282 Murphy, J., 531 Murphy, J. M., 26 Murphy, N., 716 Murray, E. A., 426 Murray, J., 354 Murray, K., 11 Murray, K. T., 466, 644 Murray, L., 114, 151, 406, 437, 464, 492, 553 Murrie, D. C., 42, 45, 57, 58, 147, 157, 197, 468, 590, 612, 665, 667, 686, 687, 688, 693, 736, 737, 738, 740, 741, 744 Mussen, P. A., 484 Musser, E. D., 109, 111, 468 Musser, P. H., 715 Muthén, B. O., 43 Muthén, L. K., 43 Mychack, P., 390 Myers, J., 129 Myers, W. C., 619 Mykletun, A., 205, 531, 734 Nadelhoffer, T., 589 Nagin, D. S., 367 Naragon-Gainey, K., 263 Narr, K. L., 382, 385, 388, 402, 596, 645 Nathan, S., 492, 594 Nathanson, C., 61, 594 Naumann, L. P., 198 Nayak, B. S., 393 Nazar, S., 586 Neal, T. M. S., 39, 47, 55, 59, 61, 225, 226, 227, 228, 251 Neale, B. M., 347

## Author Index

Neale, M. C., 129, 336, 641, 646, 649 Nedelec, J. L., 519 Nedopil, N., 542, 550, 553 Nee, J., 283 Need, A. C., 12, 17 Neeson, L., 31 Neidert, G. L., 220 Neiswanger, K., 648 Nelson, E., 672 Nelson, L. D., 10, 11, 17, 41, 127, 131, 134, 135, 137, 138, 325, 327, 424, 426, 428, 429, 430, 596, 637, 645, 760, 767 Nelson, P., 578, 580 Nelson, R. J., 342 Nelson, S. E., 368 Nemeroff, C. B., 426 Neo, L. H., 545 Nestor, G., 621 Netter, P., 342 Neufeld, R. W., 384, 724 Neugebauer, R., 392 Neuhaus, E., 108, 109, 647 Neumann, C. S., 9, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 54, 55, 58, 59, 60, 61, 62, 63, 65, 66, 67, 68, 69, 100, 145, 146, 157, 168, 171, 174, 175, 179, 200, 220, 225, 230, 231, 249, 251, 276, 282, 285, 286, 287, 290, 291, 292, 298, 301, 354, 363, 381, 404, 423, 463, 482, 483, 487, 497, 510, 512, 513, 520, 529, 531, 535, 536, 537, 540, 550, 556, 574, 589, 590, 595, 596, 612, 615, 620, 624, 626, 638, 639, 640, 664, 667, 668, 671, 687-688, 690, 691, 692, 695, 697, 710, 758, 760, 769 Neves, A. C., 529, 545, 553, 695 New, A. S., 342, 410 Newcorn, J. H., 461 Newhill, C. E., 718 Newhill, M., 147 Newman, D. L., 515 Newman, J., 550 Newman, J. P., 7, 11, 16, 42, 46, 50, 51, 54, 64, 66, 68, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 101, 102, 128, 137, 168, 174, 175, 217, 218, 221, 231, 249, 276, 289, 290, 291, 302, 311, 321, 385, 386, 390, 402, 403, 406, 407, 411, 428, 430, 433, 434, 445, 461, 492, 510, 511, 516, 520, 521, 522, 532, 537, 538, 540, 550, 551, 553, 555, 557, 587, 590, 594, 617, 636, 637, 639, 640, 644, 645, 650, 671, 690, 692, 697, 716, 767 Newson, E., 359 Newson, J., 359 Newton, E. K., 469 Nguyen, T. T., 649 Nichol, P. E., 43, 285, 302, 437, 536, 588 Nicholaichuk, T. P., 667, 713-714, 715 Nicholls, T. L., 363, 364, 612, 626, 690, 719 Nichols, K. E., 462 Nichols, S. L., 83 Nicholson, B. C., 515 Nicholson, E., 684 Nielsen, L., 135

Niemenen, E., 484 Nieuwenstein, M. R., 85-86 Nigg, J. T., 12, 86, 95, 105, 106, 107, 109, 110, 111, 114, 411, 426, 431, 444, 445, 456, 457, 460, 468, 648, 743, 760, 767 Nijman, H., 543, 552, 624 Nikolas, M., 648 Nikolova, N. L., 687, 746 Nilsson, K. W., 342 Nilsson, T., 695 Nimmo-Smith, I., 405 Nitschke, J., 46, 612, 619, 670, 674 Nolen-Hoeksema, S., 642 Noll, T., 667 Noom, M., 486, 489, 547 Nordstrom, B. R., 381 Norman, A. L., 411 Norman, D. A., 81 Norris, A. L., 176, 234, 615 Norris, C. S., 575 Nouvion, S. O., 626 Novakovic-Agopian, T., 393 Nowicki, E., 357 Nowrouzi, B., 150, 343, 495 Nunes, C., 538 Nunner-Winkler, G., 465 Nyalakanti, P. K., 50, 384, 402 Nyholm, J. O., 42, 58 Oberfield, R. A., 135 O'Boyle, E. H., 263, 265, 266, 596 Obradović, J., 147, 148, 490, 497, 761 O'Brien, B. S., 485, 493, 497, 625 O'Brien, C. P., 637 O'Brien, J. D., 461 O'Carroll, A. M., 342 Ochsner, K. N., 409 O'Connor, D. A., 512 Odgers, C. L., 366, 514, 694, 724 Odgers, D. L., 459, 460 Odlaug, B. L., 134 O'Doherty, J. P., 410, 411, 412 Ogburn, E., 638 Ogilvie, J. M., 431 Ogloff, J., 626 Ogloff, J. P., 612 Ogloff, J. R. P., 42, 54, 58, 513, 554, 690, 699, 710, 715, 732, 734, 735, 740 Ogloff, R. P., 193 O'Hagan, S. E., 220 Ohlin, L., 299, 456 Öhman, A., 84, 425 Ojanen, T., 484 O'Kearney, R., 404, 447, 494, 554 Okita, T., 86 Olderbak, S. G., 669 Oldham, J. M., 285, 619 Olds, D. L., 370, 371 O'Leary, K. D., 614 O'Leary, M. M., 518 Oligny, P., 614 Oliver, B. R., 153, 484, 490, 491, 497, 595, 769 Olivera-Aguilar, M., 63 Olson, B. D., 297 Olson, S. L., 386, 410

Olver, M. E., 55, 62, 215, 312, 324, 557, 595, 665, 667, 685, 688, 691, 692, 693, 695, 699, 700, 712, 713, 714, 715, 717, 720, 738, 741, 743 Olweus, D., 518 O'Neill, K., 648 O'Neill, M. L., 640, 648 Ong, E. L., 484 Onken, L., 716 Ono, M., 391 Oppenheim, D., 485 Orban, S. A., 445 O'Reilly, R. C., 428 Orellana, G., 389 Orne, M. T., 424 Orobrio de Castro, B., 484 Orr, S., 343 Ortiz, J., 136 Orue, I., 489 Osborne, J. W., 537 Osborne, M. L., 613 O'Shaughnessy, R., 618, 625, 673, 688 Osterheider, M., 553, 619, 670, 674 Osterman, K., 515 Ostrov, J. M., 457, 616 Osumi, T., 384 O'Toole, M. E., 574 Otowa, T., 436 Otto, J. M., 647 Otto, M. W., 648 Otto, R. K., 148, 686, 734, 736 Özdemir, M., 363, 370 Özdevecioğlu, M., 596 Ozer, D. J., 276, 286 Ozokyay, K., 534 Ozonoff, S., 413 Packer, I. K., 39, 698, 733 Pailing, P. E., 136, 646 Pakalniskiene, V., 370 Palac, C. A., 740 Palermo, R., 404, 447, 494, 554 Palma-Oliveira, J. M., 529, 545, 695 Palmstierna, T., 639 Palumbo, I. M., 16, 443, 570 Pamidi, N., 393 Panaviotou, G., 551, 554 Pankow, J., 648 Panksepp, J., 409 Paparozzi, M., 666 Pardini, D. A., 40, 49, 55, 58, 59, 60, 61, 62, 115, 146, 147, 149, 151, 152, 154, 385, 405, 406, 458, 464, 466, 467, 483, 490, 492, 514, 612, 613, 688, 720, 723, 755, 760, 761, 762, 763, 766, 768, 769 Parent, G., 667 Paris, F., 512 Park, A., 636 Park, S., 389, 392 Park, Y., 50, 58, 335, 425, 491, 646, 762 Parker, B., 588 Parsian, A., 647 Parsons, B. V., 371 Parsons, L. B., 217 Partridge, G. E., 22 Pasalich, D. S., 151, 153, 406, 466, 762, 763

Pashler, H. E., 86 Pasion, R., 431 Passamonti, L., 403 Passey, J., 177 Passow, D., 532, 542 Pastor, M. C., 433, 533, 545, 554 Patel, R., 393 Patrick, C. J., 3, 4, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 34, 36, 39, 40, 41, 42-43, 48, 49, 50, 52, 54, 63, 64, 68, 80, 95, 100, 101, 102, 103, 104, 110, 116, 127, 130, 131, 132, 133, 134, 135, 136, 137, 138, 147, 148, 165, 166, 167, 168, 169, 170, 171, 172, 174, 175, 178, 179, 180, 181, 189, 200, 216, 219, 220, 224, 231, 232, 235, 236, 237, 238, 239, 245, 247, 248, 249, 250, 264, 266, 269, 270, 276, 284, 285, 286, 290, 291, 298, 301, 302, 303, 304, 311, 315, 320, 321, 324, 325, 327, 338, 340, 345, 346, 355, 363, 364, 368, 381, 390, 414, 422, 423, 424, 425, 426, 427, 429, 430, 431, 432, 433, 434, 435, 437, 438, 439, 442, 443, 445, 447, 458, 481, 482, 483, 487, 492, 497, 511, 513, 516, 517, 520, 521, 536, 537, 538, 551, 552, 554, 555, 570, 572, 573, 576, 581, 587, 588, 589, 591, 592, 593, 596, 597, 598, 599, 613, 615, 616, 620, 622, 625, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 671, 672, 673, 693, 697, 698, 712, 717, 721, 726, 734, 742, 755, 756, 758, 760, 763, 764, 765, 766, 767, 768, 769, 771, 772 Patterson, C. M., 81, 82, 83, 137, 407, 430, 554, 555 Patterson, G. R., 27, 113, 359, 370, 443, 459, 484 Patterson, M. C., 521 Paul, J. F., 145 Paul, L. K., 391 Pauletti, R. E., 484 Paulhus, D. L., 9, 13, 45, 58, 59, 60, 61, 68, 132, 166, 171, 212, 216, 220, 225, 251, 266, 270, 276, 291, 292, 302, 385, 423, 441, 520, 593, 594, 612, 620, 668, 670, 768 Paulmann, S., 439 Paulus, M. P., 341 Payamal, L. T., 545 Payne, D. L., 669 Payne, K. T., 176 Peacock, E. J., 688, 713 Pech, R. J., 596 Pechorro, P., 514, 538, 539, 540, 548 Pedersen, L., 206, 207, 531, 544, 626, 698 Pell, M. D., 439 Peltonen, T., 457, 515 Penelo, E., 146, 467 Penna, S., 225 Pennebaker, J. W., 622 Penney, S. R., 515 Pennington, B. F., 105, 413 Peraza, D. M., 645 Pereira, M. R., 431 Peretto, P., 394 Perkins, E. R., 429 Perrett, D. I., 405

Perry, D. G., 484 Perry, J. C., 287 Perry, M., 221 Persons, R. W., 665 Peskin, J., 483 Pessoa, L., 405, 409 Peters, J., 199, 200 Peters, R. D., 553 Peterson, J. B., 96, 263 Peterson, R. A., 219 Peterson-Rohne, A., 715 Petrides, M., 427 Petrila, J., 39, 42, 189, 689, 698, 701, 732, 733, 739, 740 Petry, N., 650 Pettinati, H. M., 648 Pettit, G. S., 370, 410, 458 Pettus, C., 128 Pfabigan, D. M., 520 Pham, T. H., 532, 533, 541, 543, 550, 554, 555 Phan, K. L., 410 Phil, D., 386, 389, 392 Philibert, R. A., 393, 647 Philippot, P., 543, 554, 555 Phillips, M., 405 Phillips, O. R., 393 Phillips, T. R., 8, 132, 148, 175, 220, 221, 224, 234, 235, 236, 237, 238, 239, 246, 248, 291, 423, 424, 433, 436, 598 Phillipson, J., 363 Pianka, E. R., 664 Pickens, R. W., 646 Piedmont, R. L., 135, 180, 216 Pincus, A. L., 260, 261, 287, 496, 641 Pinderhughes, E. E., 762 Pine, D. S., 410, 481, 672 Pinel, P., 4 Pingault, J. B., 146 Piotrowski, N. A., 515 Piquero, A. R., 356, 371, 515, 595, 720, 772 Pithers, W. D., 696 Pitts, T. B., 458 Pizzagalli, D. A., 426 Platt, M. L., 405 Platt, T., 620 Plichta, M. M., 108, 411 Pliszka, S., 462 Plomin, R., 50, 145, 149, 150, 153, 338, 344, 464, 514, 595, 646, 771 Pogarsky, G., 367 Pogge, D. L., 640 Poiares, C., 540 Pokela, E., 359 Polak, A., 483 Polaschek, D. L. L., 101, 235, 298, 483, 592, 615, 699, 710, 712, 713, 714, 716, 718, 719, 738, 739, 765, 766 Polich, J., 645 Pollastri, A. R., 646 Ponce, G., 342, 648 Ponitz, C. C., 485 Ponticas, Y., 135 Poortinga, Y. H., 691 Pope, K., 411, 412, 414 Porjesz, B., 645 Poropat, A. E., 262

#### Porter, S., 44, 47, 55, 286, 300, 354, 442, 443, 458, 494, 495, 554, 573, 574, 594, 611, 612, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 673, 688, 696, 697 Posner, M. I., 87, 645 Potapova, N., 647 Potter, M. C., 86 Pottier, D., 595 Poustka, F., 402, 408 Poustka, L., 152 Powell, N., 149, 490, 762 Power, T. G., 370 Powers, S. I., 517 Poy, R., 13, 14, 16, 132, 168, 178, 235, 237, 238, 267, 273, 424, 435, 536, 538, 544, 552 Poythress, G., 46 Poythress, N. G., 39, 45, 54, 100, 145, 146, 148, 189, 216, 222, 224, 248, 302, 303, 312, 315, 321, 324, 363, 442, 488, 489, 519, 540, 596, 597, 614, 616, 617, 625, 640, 665, 693, 694, 696, 697, 717, 718, 719, 738, 740, 741, 742 Pozzebon, J. A., 179, 670 Preacher, K. J., 692 Prentky, R. A., 665 Prescott, C. A., 129, 641 Preston, D., 619 Preston, D. L., 673 Preuss, U. W., 647 Price, J. D., 484 Price, L., 217 Price, M. J., 154, 762 Price, S. D., 550 Prichard, Z. M., 341 Prins, P. J., 372, 720 Prinstein, M. J., 457 Pritchard, J. C., 4 Proman, J. M., 69 Proudfit, G. H., 646 Proulx, J., 666 Proyer, R. T., 620 Pryor, L. R., 178, 262, 593 Przybeck, T., 289, 691 Pugh, S., 593 Pujara, M., 385, 411 Pulkkinen, L., 613 Purcell, S., 95 Putman, P., 593 Putnam, K. M., 381, 427 Qu, T., 394 Quade, D., 128 Quadros, I. M., 342 Quanbeck, C. D., 695 Quay, H. C., 128, 170, 217, 462, 482, 483, 636 Quay, L. C., 128 Quilty, L. C., 96, 263 Quinet, K., 572, 573 Quinn, M. J., 80 Quinn, P. D., 726 Quinsey, V. L., 46, 50, 64, 587, 589, 593, 612, 618, 619, 621, 664, 683, 685, 688, 698, 738 Raaijmakers, Q., 552

Raaijmakers, Q., 55 Rada, R. T., 665

## Author Index

Radin, P., 531 Radke-Yarrow, M., 484 Raftery, A. E., 306 Raichle, M. E., 645 Raine, A., 12, 50, 54, 61, 62, 68, 104, 136, 149, 152, 339, 363, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 402, 403, 406, 410, 431, 433, 458, 462, 494, 529, 549, 554, 585, 587, 589, 593, 595, 596, 599, 613, 616, 625, 644, 645, 646, 664, 672, 673, 765, 766 Ralph, A., 639, 641 Ramsland, K., 570 Rand-Hendriksen, K., 638 Rangel, A., 410 Rankin, J. H., 364 Rao, S. S., 393 Rappaport, K., 668 Rapport, M. D., 445 Rasanen, P., 367 Rashid, T., 394 Raskin, R., 287, 668, 670 Rasmussen, K., 206, 531, 533, 538, 544, 550, 626, 698 Raudenbush, S. W., 369 Rausher, S., 240, 244, 270, 447, 621 Rauthmann, J. F., 589 Ray, J. A., 27 Ray, J. V., 11, 45, 144, 152, 216, 298, 424, 464, 465, 480, 538, 550, 574, 598, 625, 719, 743, 757, 763 Raymond, J. E., 85 Rayson, P., 622 Realo, A., 263 Reardon, K. W., 135 Reardon, M. L., 9, 290, 636, 639 Rector, R., 36 Redpath, D. P., 724 Reese, J., 341 Regier, D. A., 23, 31, 281, 638, 743 Reich, T., 517, 519, 636, 648 Reid, J., 636 Reid, J. B., 113, 372, 443, 459 Reidy, D. E., 84, 593, 594, 611, 614, 615, 616 Reidy, T. J., 733 Reijntjes, A., 760 Reinberg, D., 95 Reinecke, M. A., 484 Reise, S. P., 63, 276 Reiss, A. J., 368 Reiss, A. L., 645 Reiss, D., 135 Remacle, C., 393 Remington, N. A., 715 Rennie, C., 146, 529, 539, 546, 553 Rennie, C. E., 45 Renwick, S., 534, 639 Renwick, S. J., 190, 310, 321, 552, 623 Repo-Tiihonen, E., 673 Reppucci, N. D., 514 Rescorla, R. A., 405, 410, 411 Ressler, R. K., 571, 577 Rettenberger, M., 695 Retz, W., 342 Retz-Junginger, P., 342 Reusens, B., 393 Reuter, M., 342

Reynolds, C., 386 Reynolds, M., 644 Reynolds, R., 460, 686 Reynolds, S. M., 53 Rhee, S. H., 50, 58, 335, 338, 340, 425, 491, 519, 646, 762 Rhodes, T., 154 Ribeiro da Silva, D., 496 Rice, E., 30 Rice, F., 393 Rice, M., 612, 738 Rice, M. E., 42, 46, 50, 58, 363, 550, 589, 612, 617, 618, 664, 683, 688, 696, 698, 699, 710, 712, 713, 715, 736, 739, 741 Rich, B., 665 Richard, D. C. S., 215 Richards, H. J., 514, 648, 686, 691, 715 Richell, R. A., 413 Richmond, T. S., 765 Riemann, R., 216 Rijo, D., 496 Rijsdijk, F. V., 146, 148, 149, 339, 495, 538, 595, 761 Riley, R. D., 151 Rilling, J. K., 589 Rime, B., 543, 554 Rimmer, J., 636 Rinaldi, J., 371 Ripke, S., 347 Riser, R. E., 54, 550 Ritzer, D. R., 590, 599 Rivera, C., 364 Robbins, P., 612 Robbins, P. C., 517 Robbins, T. W., 427 Roberts, A., 593, 639, 687 Roberts, A. C., 427 Roberts, B. W., 262, 263, 276, 298, 718 Roberts, N., 383 Roberts, R., 715 Robertson, C., 67 Robertson, C. A., 619, 670, 673, 674 Robins, E., 282, 480 Robins, L. N., 8, 23, 31, 50, 52, 282, 283, 284, 289, 290, 298, 354, 366, 373, 480, 582, 691 Robins, L. R., 217, 218 Robins, R. W., 13, 302 Robinson, E. V., 594 Robinson, M., 263 Robinson, M. D., 263 Robinson, T. E., 97, 425, 426, 427 Roche, M. J., 496 Rock, R. C., 234, 246, 688 Rockett, J., 468 Rockstroh, B., 768 Rodger, S., 357 Rodgers, R. F., 484 Rodriguez, G., 146, 763 Roettger, M. E., 341 Rogers, C. R., 191 Rogers, J., 239 Rogers, J. S. C., 61 Rogers, R., 42, 57, 58, 59, 62, 144, 157, 189, 216, 217, 282, 285, 286, 290, 355, 456, 463, 495, 496, 509, 511, 512, 514, 532, 540, 612, 621, 625, 639, 664, 667, 683, 690, 691, 743

Rogers, R. D., 390 Rogosch, F. A., 149, 364, 445, 674, 767 Rogstad, J. E., 509 Roiser, J. P., 59, 61, 251, 513, 589, 765 Rollnick, S., 650 Rolls, E. T., 427, 644 Romilly, C., 356 Rommelse, N. N., 388, 762 Romney, D. M., 369 Ronan, K. R., 372, 721 Ronis, S. T., 666 Ronningstam, E., 287, 288 Rooke, S. E., 263 Roose, A., 145, 146, 468, 539, 540, 547, 551, 552 Roosevelt, T., 173, 174, 178 Rorden, C., 764, 765 Rosch, E., 205 Rose, R. J., 646 Rosenberg, R., 666 Rosenfeld, B., 716 Rosenfield, D., 496, 762 Rosenthal, R., 177, 737 Roskamp, P., 740 Rösler, M., 342 Rosnow, R. L., 737 Rosolack, T. K., 178 Ross, B. E., 217, 247 Ross, E. C., 699 Ross, F. E., 220 Ross, R. R., 715 Ross, S. R., 13, 168, 173, 175, 231, 269, 593, 597, 599 Rossegger, A., 532, 667 Roth, J., 665 Rothbart, M. K., 11, 95, 97, 99, 106, 107, 428, 465 Rothbaum, A., 264, 269 Rothbaum, F., 358 Rothemund, Y., 390, 435 Roth-Hanania, R., 484 Roussy, S., 555 Rowe, J. B., 409 Rowe, R., 156, 465, 467, 546, 551 Rowland, M. D., 721 Rowland, M. W., 519 Roy, A., 518 Roy, S., 67 Ruan, W. J., 638 Rubia, K., 411, 413 Rubin, R. M., 458 Rubinstein, M., 341 Rubinstein, T., 11, 434 Rubinstein, T. J., 168 Rucevic, S., 518, 521 Ruch, W., 620 Ruchkin, V. V., 540 Rucker, L., 366 Rufino, K. A., 42, 57, 197, 667, 686, 687, 736, 737, 744 Ruiz, M. A., 641 Rulseh, A., 205, 734 Ruscio, A. M., 664 Ruscio, J., 45, 356, 590, 664, 665, 738 Russakoff, L. M., 619 Russell, S., 96 Rutherford, M., 283, 715 Rutherford, M. J., 512, 513, 515, 521, 648

Rutter, M., 95, 101, 150, 369, 468 Ruzic, L., 413 Ryan, D., 513 Rypdal, K., 205, 531, 734 Sabol, S. Z., 647 Sabri, M., 86 Sachek, J., 106 Sachs-Ericsson, N., 8, 134 Sackett, P. R., 178 Sacks, S., 648 Sadeh, N., 66, 84, 150, 153, 342, 516, 517, 518, 520, 522, 529, 648 Saha, T. D., 638 Saigh, P. A., 135 Sailer, U., 520 Saito, T., 647 Saks, E. R., 586 Salekin, R. T., 39, 45, 48, 51, 53, 62, 100, 134, 144, 147, 153, 154, 170, 220, 221, 222, 223, 224, 225, 232, 234, 282, 285, 286, 290, 316, 321, 324, 354, 355, 370, 372, 373, 425, 435, 456, 479, 482, 483, 484, 485, 486, 487, 488, 492, 495, 496, 497, 498, 510, 511, 512, 514, 517, 522, 532, 538, 540, 550, 553, 589, 595, 597, 612, 625, 640, 667, 683, 688, 691, 694, 695, 699, 701, 710, 715, 716, 720, 724, 726, 738, 739, 741, 743, 757, 769 Salenius, S., 673 Salihovic, S., 363, 370 Salmivalli, C., 484 Saloppé, X., 532, 533, 541, 543, 550 Salvatore, J. E., 138 Salvia, J., 128 Sampson, R. J., 369 Samuel, D. B., 53, 179, 263 Sanders, M., 371 Sanders, M. R., 371 Sandifer, M. G., 128 Sandomierski, M., 485 Sandseter, E. H., 485 Sandvik, A. M., 225, 226, 230, 531, 532 Sanecka, E., 598 Sanford, G., 9, 664, 665, 738, 740 Sanford, G. M., 536 Sanislow, C. A., 642 Santo, J., 386, 484 Santor, D., 354, 625 Saradjian, J., 716 Sarkar, S., 403 Sarty, G. E., 312, 324, 699 Sasagawa, S., 145, 303, 467, 514, 539, 548 Sass, H., 39, 80, 534 Sathasivam, N., 434 Saucier, G., 201, 206 Saudou, F., 341, 342 Saul, R. E., 390 Sauvigné, K. C., 169 Savage, J. C., 554 Sawalani, G. M., 457 Sawyer, A. T., 648 Sawyer, M. G., 769 Scabini, D., 276 Scalora, M., 663, 688 Scarpa, A., 390 Scerbo, A., 493, 555 Schaap, G., 544

Schaeffer, C. M., 649 Schalling, D., 518, 542, 551 Schecter, H., 570 Scheepers, F. E., 388, 762 Scheffers, M., 86, 428 Schell, A. M., 433 Schellekens, A. F. A., 647 Scheres, A., 108, 411 Schermer, J., 620 Schiavo, R. S., 371 Schiff, H. C., 405 Schiffer, B., 381, 385, 392 Schilling, F., 612, 618, 674 Schindler, O., 31 Schinka, J. A., 641 Schlenger, W. E., 515 Schmauk, F. J., 431 Schmeelk, K. M., 515 Schmeidler, J., 696 Schmidt, F., 550, 553, 557, 641, 692, 694, 695 Schmidt, F. L., 690 Schmidt, L. A., 341 Schmitt, D. P., 263, 589, 670 Schmitt, D. S., 59, 529 Schmitt, W. A., 80, 83, 85, 221, 290, 403, 551, 557, 692, 767 Schnapp, W., 412 Schneider, B., 666 Schneider, F., 384, 387, 435 Schneider, K., 4, 40, 200 Schneider, R. J., 178 Schneider, S., 411 Schneider, W., 81 Schoenbaum, G., 410, 411 Schoenwald, S. K., 372, 721 Scholte, E., 483, 551 Schonenberg, M., 406 Schrum, C. L., 45, 488, 511, 512, 540 Schubert, C. A., 483, 760 Schug, R. A., 62, 152, 391, 406, 587 Schulreich, S., 520 Schultz, E. W., 128 Schultz, N., 516 Schulz, K. P., 413, 644 Schumann, G., 765, 771 Schutte, N. S., 263, 641 Schutter, D. J., 391, 593, 724 Schwartz, B., 176 Schwartz, J. A., 519 Schwartz, J. L., 621 Schwartzman, A., 386, 484 Schwenck, C., 151 Scott, C. L., 695 Scott, E., 719 Scott, S., 371, 404, 438, 493, 546, 553, 595 Scott, T.-L., 667 Seagrave, D., 483 Seara-Cardoso, A., 50, 54, 59, 61, 152, 228, 229, 230, 251, 441, 442, 513, 520, 589, 765 Sears, R. M., 405 Sebastian, C. L., 151, 404, 441, 494, 546, 555, 764, 765 Sechrest, L., 212, 685 Seeman, P., 341 Sees, K. L., 515

Segall, M. H., 691 Segalowitz, S. J., 136, 646 Segarra, P., 13, 132, 178, 235, 267, 273, 424, 538 Seibert, L. A., 222, 223, 225, 226, 227, 248, 611, 614 Seivewright, H., 718 Sellbom, M., 8, 14, 36, 53, 59, 61, 132, 134, 147, 148, 168, 170, 171, 172, 175, 176, 190, 206, 211, 212, 215, 219, 220, 221, 224, 225, 226, 227, 228, 233, 234, 235, 236, 237, 238, 239, 246, 247, 248, 251, 291, 423, 424, 433, 436, 510, 511, 512, 513, 587, 593, 598, 670, 685, 688, 742, 756, 758, 759 Selwyn, C. N., 621 Semple, W. E., 381 Seo, W. Y., 342 Sepa, A., 363 Serences, J. T., 87 Serin, R. C., 55, 553, 612, 619, 665, 673, 713 Serran, G. A., 688 Servan-Schreiber, D., 426 Sestoft, D., 538 Seto, M. C., 619, 621, 673, 688, 713, 715 Sevecke, K., 364, 516, 519, 550 Sewall, L. A., 312, 324, 663, 699 Sewell, K. W., 157, 282, 286, 495, 511, 514, 532, 612, 683, 691, 743 Sexton, T. L., 371 Seymour, B., 409 Shadish, W. R., 248 Shah, S. A., 682 Shallice, T., 81 Sham, P., 95 Sham, P. C., 347 Shane, M. S., 406 Shannon, R. W., 439 Shapira, J. S., 390 Shapiro, D., 89 Shapiro, K. L., 85 Shariat, S. V., 532, 537 Sharma, L., 642 Sharma, T., 385 Sharp, C., 135, 546 Shaver, P. R., 442 Shaw, C. R., 369 Shaw, D., 760 Shaw, J., 626 Shea, S. C., 189, 192, 193 Shedler, J., 284 Sheese, B. E., 428 Sheidow, A. J., 721 Shelley-Tremblay, J. F., 616 Shelton, K. K., 359, 595 Shepherd, E., 190, 191, 192, 196 Shepherd, S. M., 42 Sher, K. J., 7, 8, 47, 289, 516, 635, 636, 637, 638, 641, 642, 643, 644, 650 Sheriff, C., 663 Sherman, E., 267, 269, 271, 273, 274 Sherman, M., 512 Shields, J., 345 Shields, S. M., 757 Shiffrin, R. M., 81 Shih, J. C., 341, 647 Shimizu, Y., 766

Shine, J., 533, 534, 536, 715 Shiner, R. L., 263, 298, 718 Shipley, S., 80 Shoss, N. E., 496 Shou, Y., 221, 224 Shrout, P. E., 645 Shulman, H. S., 128 Shum, D. H. K., 431 Sickmund, M., 27 Siddle, D. A. T., 81 Siegel, A., 409 Siegel, T. C., 371 Siever, L. J., 41, 300 Sijtsma, K., 234 Sikki, M., 443, 538 Sikström, S., 108, 109 Sikweyiya, Y., 669 Silva, J. A., 574 Silva, P. A., 7, 8, 25, 129, 131, 299, 367, 369, 424, 459, 461, 595, 637, 715, 771 Silver, C., 484 Silver, E., 517, 595, 600, 612 Silverstein, M. L., 41 Silverthorn, P., 291, 457, 460, 467, 515, 521, 540, 595, 686 Simen, A., 648 Simms, L. J., 298 Simons, R. F., 432 Simonson, E., 40 Simpson, J. A., 176 Sims-Knight, J. E., 664, 666, 668, 669, 670, 673, 674 Sinclair, S., 412, 464, 495 Singer, T., 405 Singh, J. P., 39, 47, 667, 684, 687, 690, 691, 699, 712 Sinha, R., 647 Sinnott-Armstrong, W., 39, 47, 54, 58, 589 Sissons, M. K. A., 719 Skeem, J. L., 40, 47, 49, 52, 54, 62, 64, 101, 102, 116, 145, 146, 147, 154, 155, 172, 189, 199, 202, 235, 249, 285, 286, 287, 298, 312, 318, 319, 321, 324, 354, 363, 435, 445, 461, 464, 468, 483, 496, 511, 535, 536, 540, 550, 551, 553, 559, 592, 598, 615, 616, 617, 623, 626, 667, 684, 690, 691, 695, 696, 697, 699, 710, 712, 713, 716, 717, 718, 719, 720, 721, 722, 724, 725, 734, 738, 739, 740, 741, 743, 763, 765, 766 Skelly, L. R., 405, 406, 407, 408, 440, 441, 765 Skilling, T., 738 Skilling, T. A., 612, 664 Skodol, A. E., 53, 170, 282, 284, 285, 300, 645, 757 Skopp, N. A., 595 Skøt, L., 638 Slade, B. W., 596 Sleep, C. E., 54, 759 Slobogin, C., 740 Slutske, W. S., 129, 134, 289, 343, 642, 646 Smallbone, S., 665, 666 Smart, L., 484 Smeets, T., 152 Smiley, W. C., 667

Smith, A. A., 135 Smith, A. B., 411, 413 Smith, A. M., 644 Smith, A. R., 411 Smith, C. A., 357, 359, 364, 365, 367, 370 Smith, G. T., 61, 178, 199, 200, 207, 591, 643,650 Smith, I. M., 485 Smith, J., 621 Smith, J. R., 369 Smith, L., 287 Smith, L. A., 372 Smith, M., 88, 437, 664 Smith, P., 682, 698, 742 Smith, P. N., 621 Smith, R. J., 220, 585 Smith, S., 589, 616, 696 Smith, S. F., 10, 54, 165, 166, 172, 173, 174, 175, 176, 230, 235, 239, 263, 426, 576, 586, 596, 769 Smith, S. J., 589 Smith, S. S., 84, 221, 289, 290, 302, 510, 532, 537, 538, 550, 617, 636, 639, 690, 692 Smith, S. T., 16, 36, 174, 176, 180, 205, 247, 319, 321, 325, 686, 698, 734, 736, 744, 745, 746, 771 Smits, N., 45 Smolka, M. N., 647 Smoller, J. W., 646 Smulders, F. T., 86 Snidman, N., 465 Snowden, R., 442, 529 Snowden, R. J., 63, 431, 593, 612, 614, 621, 689 Snyder, H. N., 27 So, K. F., 393 Sockloskie, R. J., 668 Söderlund, G., 108, 109 Soderstrom, H., 383, 386 Solanto, M. V., 341 Solodukhin, E., 614, 690 Somech, L. Y., 549, 551, 762 Somma, A., 147, 221, 489 Sommer, J., 534 Sommer, M., 390 Sommers-Flanagan, J., 189, 191, 192 Sommers-Flanagan, R., 189, 191, 192 Sonuga-Barke, E., 150, 468 Sonuga-Barke, J. S., 106 Sörman, K., 205, 686, 736 Soto, C. J., 263 Soto-Moyano, R., 393 Sourander, A., 320, 321, 324, 598 South, S. C., 512, 514 Soyfer, L., 765 Soyka, M., 647 Spain, S. E., 488 Sparkes, L., 613 Spence, S. A., 387 Spencer, S. J., 484 Spender, Q., 371 Spidel, A., 612, 613, 621, 664 Spielberg, S., 31 Spielberger, C. D., 96, 220 Spinath, F. M., 771 Spinks, J. A., 81 Spinrad, T. L., 99

Spitzer, R. L., 232, 282, 283, 356, 480, 669, 758 Spitznagel, E. L., 638 Sporer, S. L., 484 Sprague, J., 516, 517, 521 Sprague, R. L., 128 Spreen, O., 41 Spreng, R. N., 393 Squire, L. R., 428 Srivastava, S., 202, 225, 261, 262 Sroufe, L. A., 363 Stacy, A. W., 644 Stadler, C., 152, 402, 408, 494 Stadtland, C., 553 Stafford, E., 512 Stafford, K. P., 593 Stafford, K. S., 215 Stalenheim, E. G., 541, 542, 550 Stålenheim, G., 695 Stallings, M. C., 104, 129, 343, 431, 646 Staner, L., 342 Stanford, M. S., 433, 520, 613, 614, 616 Stanger, C., 483 Stanley, J. H., 132, 175, 235, 236, 238, 239, 291, 598 Stanton, W., 299, 459 Stark, S., 263 Starzomski, A., 617 Starzyk, K. B., 216 Stattin, H., 9, 132, 146, 153, 172, 266, 338, 382, 423, 480, 518, 551, 595, 640, 693, 720 Steadman, H., 45, 62 Steadman, H. J., 696 Steele, V. R., 137, 430 Stegge, H., 484, 490, 613, 624 Steinberg, L., 156, 595, 672, 720, 726 Steinhauer, S. R., 390 Steinley, D., 304, 305, 306, 307, 313, 314 Stellwagen, K. K., 484 Stenger, V. A., 427 Stepp, S., 458, 763 Stern, S. B., 315, 321, 357, 359, 370, 623 Sterzer, P., 402, 408 Steuerwald, B. L., 217, 692 Stevens, D., 216, 404, 437, 546, 553 Stevens, G. W., 594, 613 Stevens, M. C., 402 Stevenson, J., 336 Stevenson, R. J., 59, 61, 225, 593 Stewart, A. L., 431 Stickle, T. R., 458, 465, 492, 496 Stinson, F. S., 638 Stitzer, M., 650 Stobbe, Y., 554 Stockdale, K. C., 557, 667, 688, 692, 694, 720, 741 Stoddard, J., 386 Stoddart, P. R., 764 Stokes, J. L., 640 Stoléru, S., 672, 673 Stoll, E., 205, 206 Stone, M., 286, 287, 575 Stoppelbein, L., 145 Storey, J. E., 47 Storsaeter, O., 538, 544 Story, P. A., 263 Stose, S., 387

Stout, J. C., 593 Stouthamer-Loeber, M., 39, 61, 68, 144, 355, 359, 364, 366, 367, 370, 390, 458, 483, 488, 515, 538, 613, 639, 688, 692, 700, 741, 761, 763, 771 Stoutjesdijk, R., 483 Strack, S., 619, 673 Strand, S., 46, 511, 512, 691 Strauss, E., 41, 84 Strauss, M. E., 207 Strickland, C. M., 11, 15, 54, 134, 235, 238, 264, 325, 424, 726, 758, 759 Stringaris, A., 480, 481 Stritzke, W. G. K., 434 Stuart, G. L., 617, 688 Stubblefield, M., 383 Stucke, T. S., 484 Stucky, B. D., 457 Sturup, J., 736, 737, 743, 744 Suchy, Y., 550 Sue, S., 511 Sugaya, K., 394 Sugerman, A. A., 648 Suhr, J., 593 Sullivan, E. A., 46, 529, 534, 535, 537, 556, 557, 691 Sullivan, E. S., 442 Sullivan, H. S., 193 Sullivan, L., 27 Sullivan, L. E., 486 Sullivan, M. W., 483 Sundby, S. E., 745 Sundram, F., 54, 386, 403 Supprian, T., 342 Susman, V. L., 619 Susser, E., 392 Sutherland, E., 28 Sutker, P. B., 593 Sutton, S., 645 Sutton, S. K., 101, 433, 520 Swabb-Barneveld, H., 403 Swami, V., 734 Swineford, F., 637 Swogger, M. T., 313, 314, 321, 324, 593, 594, 595, 599, 614, 626, 697 Sylvers, P., 12, 50, 96, 97, 151, 168, 291, 406, 515, 638 Symington, M. F., 391 Symington, S. H., 391 Syndulko, K., 424, 434 Syngelaki, E. M., 546, 554 Szymanowski, D., 665 Tabery, J., 734, 766 Tackett, J. L., 135, 263, 536, 769 Taft, C. T., 715 Taft, W. H., 173 Tahrani, A., 532 Takagishi, H., 597 Takahashi, A., 342 Takahashi, L. K., 409 Takahashi, Y., 410 Takayanagi, Y., 342 Talwar, V., 483, 760 Tammimäki, A. E., 647 Tanabe, J., 411 Tanaka, J. S., 668 Tang, Y., 383

Tani, P., 152 Tannock, R., 345 Tarter, R. E., 644 Tatar, J. R., 319, 321 Tatelbaum, R., 370 Taylor, A., 37 Taylor, G. J., 513 Taylor, J., 51, 128, 149, 325, 336, 338, 363, 518, 637, 639, 640, 650, 665, 689, 741, 771 Taylor, J. L., 699 Taylor, P., 385 Taylor, S. E., 342 Taylor, S. P., 412 Taylor, Z., 174 Tcheremissine, O. V., 626 Teasdale, T. W., 638 Teesson, M., 648 Telander, K., 590 Tellegen, A., 17, 24, 34, 35, 95, 129, 167, 170, 171, 172, 179, 212, 213, 215, 216, 217, 231, 232, 249, 260, 262, 269, 297, 327, 424, 433, 513, 638, 642, 670 Tellegen, C. L., 371 Templeman, R., 513, 538, 683, 688, 695 ten Brinke, L., 55 Tengström, A., 489, 516, 540, 542, 553, 640, 695 Teplin, L. A., 515 Terranova, A. M., 457 Terry, H., 287, 670 Test, A., 616 Tew, J., 716 Thagard, P., 427 Thái, S., 429 Tham, M., 86 Thapar, A., 342 Tharp, V. K., 424 Thede, L. L., 597 Thisted, R., 383 Thomaes, S., 483, 760 Thomas, J. N., 458 Thomas, K. M., 264 Thomas, R., 371 Thomas, Y. F., 638 Thome, J., 342 Thompson, A., 13, 168, 231, 269, 593 Thompson, A. C., 764 Thompson, P. J., 384 Thompson, R., 343 Thompson, R. A., 99, 469 Thompson, W. L., 387 Thomson, L., 667 Thorell, L. B., 153 Thornberry, T. P., 364, 366, 368 Thornquist, M. H., 535, 557 Thornton, D., 57, 552, 666, 667, 668, 718 Thornton, L. C., 11, 45, 144, 152, 298, 424, 464, 465, 480, 550, 574, 598, 625, 719, 720, 743, 757, 763 Thorsteinsson, E. B., 263, 641 Thurston, A., 13, 168, 231, 269, 593 Tielbeek, J. J., 344 Tien, G., 512 Tiihonen, J., 385 Tikkanen, R., 533, 542, 553, 647, 696 Tiliopoulos, N., 589 Tipp, J., 289, 691

## 800

Tippey, J. G., 496, 724 Tobin, D. D., 484 Tobin, R., 263, 276 Toga, A. W., 382, 385, 402, 596, 645 Toivonen, P., 391 Toldson, I. A., 535, 537 Tomarken, A. J., 643 Tomicic, T. L., 216 Tonnaer, F., 234 Tooby, J. E., 180 Torrubia, R., 536, 538, 544 Toupin, J., 496, 555, 693 Tracy, J. L., 13, 302 Tracy, P. E., 23 Tragesser, S. L., 636 Tramayne, S., 590 Tranel, D., 388, 390, 427 Trapnell, P. D., 594, 612 Trautwein, U., 263 Treisman, A., 86 Tremblay, R. E., 458, 614 Trentacosta, C. J., 485 Trevethan, S. D., 494 Trimble, M. R., 384 Tritch, T., 484 Trobst, K. K., 232, 488, 540 Trouton, A., 771 True, W. R., 646 Trueblood, J. S., 593 Trull, T. J., 7, 8, 289, 424, 636, 637, 638, 641, 642, 644, 650 Trzaskowski, M., 150, 344 Trzesniewski, K. H., 13, 302 Tsai, S. J., 647 Tsang, S., 45, 482 Tschupp, S., 620 Tsuang, M. T., 646, 647 Ttofi, M. M., 355, 356, 357 Tucker-Drob, E. M., 726 Tullberg, M., 383 Tully, L. A., 371 Tully, R. J., 45, 54 Turchik, J. A., 176 Turnbull, W., 213 Turner, C. W., 371 Turner, D., 686 Turner, D. B., 736, 744 Turner, D. T., 686 Turner, G. R., 393 Turner, G. W., 372 Turner, R., 357 Tusel, D. J., 515 Tuvblad, C., 104, 393, 646, 771 Twain, M., 250 Tyler, L., 540 Tyler, L. A., 463, 486 Tyrer, P., 199, 263, 718, 736, 737 Tyszka, J. M., 443 Tzelgov, J., 18 Uddin, L. Q., 391 Ullman, D., 688 Ullrich, S., 314, 320, 354, 356, 588, 591, 593, 594, 639, 687, 690 Ulrich, A., 572 Umstead, D., 715, 738 Ungerleider, L. G., 405, 409

# Author Index

Urbaniok, F., 532, 544, 667

Ustad, K. L., 514, 691 Uzieblo, K., 54, 69, 175, 234 Vachon, D. D., 39, 52, 53, 54, 69, 275, 284, 288, 639, 688, 692, 756, 759 Vahl, P., 489, 529, 540, 640 Vaidyanathan, U., 8, 11, 12, 13, 17, 101, 135, 168, 235, 245, 311, 321, 327, 346, 432, 433, 446, 495, 497, 517, 554, 596, 767 Valente, E., 410 Valentine, K. A., 589 Valiente, C., 106, 108 Vall, J., 485 Valliant, P. M., 595 van Baardewijk, Y., 489, 490, 540, 547, 613, 624, 625 van Berckelaer-Onnes, I. A., 551 van Boxtel, A., 151, 405, 464, 494, 554 van de Pol, M., 762 Van de Vijver, F. J., 537 Van Den Bos, P., 595 van den Bree, M. B. M., 646 van der Baan, H., 45, 552 Van der Gaag, R. J., 403 van der Laan, P. H., 372, 720 Van der Ploeg, J., 483, 551 Van der Wees, M., 403 van der Wolf, P., 536 van Elst, L. T., 384 Van Goozen, S., 546, 554 van Honk, J., 518, 593 van Kammen, W. B., 367 Van Leeuwen, N., 484 van Marle, H. J. C., 59 van Nieuwenhuizen, C., 719 Van Oudheusden, M. A. G., 483 Van Reenen, L., 538 Van Rybroek, G., 45, 154, 496, 699, 715, 720, 721, 739 Van Vleet, T. M., 393 Van Zalk, M., 153, 720 Vanderlinden, M., 555 Vanderpearl, R. H., 665 Vanderplasschen, W., 486, 489, 547 Vanderschuren, L. J. M. J., 724 Vanderstukken, O., 555 Vanheule, S., 44, 543, 550 Vanman, E. J., 433 VanMeter, J. W., 151, 405, 464, 764 Vanyukov, M. M., 636, 637, 644, 647 Varela, J. G., 42, 57 Varghese, F. T. N., 283 Vasey, M. W., 664 Vasilev, G., 59, 537, 639 Vassileva, J., 59, 314, 321, 324, 537, 639 Vassos, E., 342, 647 Vaughn, L. J., 66 Vaughn, M. G., 145, 147, 174, 319, 321, 324, 341, 393, 487, 488, 489, 696, 718, 719, 738 Vazire, S., 198 Vazquez, D. M., 386, 410 Vecchione, M., 483 Veen, V. C., 489, 529, 541 Veenstra, M., 489

Veit, R., 390, 594, 672 Venables, N. C., 12, 13, 14, 16, 17, 54, 103, 127, 131, 132, 133, 134, 135, 137, 148, 166, 171, 172, 178, 181, 233, 235, 236, 239, 248, 250, 286, 291, 292, 304, 325, 388, 423, 426, 427, 429, 433, 435, 436, 439, 445, 447, 581, 585, 596, 598, 637, 642, 643, 645, 646, 672, 734, 756, 760, 772 Venables, P. H., 12, 363, 386, 390, 392, 393, 494 Vergés, A., 8, 47, 289, 516, 635, 638, 644 Verhaeghe, P., 44, 543, 550, 614 Verhulst, S., 762 Vermeiren, R., 489, 490, 613, 624, 693 Vermunt, J. K., 64 Vernberg, E. M., 457 Vernon, A., 393 Vernon, P. A., 620, 646, 670 Verona, E., 8, 10, 13, 14, 62, 84, 101, 134, 135, 234, 302, 355, 433, 442, 489, 509, 514, 516, 517, 518, 519, 520, 521, 529, 538, 540, 551, 552, 557, 593, 596, 612, 620, 689, 690, 700 Verschuere, B., 442, 538 Vertommen, H., 535 Verweij, K. J. H., 436 Veselka, L., 620, 670 Vetter, S., 532 Vevera, J., 647 Vidal, S., 468 Viding, E., 10, 11, 50, 54, 58, 59, 61, 86, 95, 110, 111, 112, 114, 134, 144, 145, 146, 148, 149, 150, 151, 152, 153, 154, 239, 251, 338, 339, 344, 346, 404, 405, 406, 408, 410, 424, 428, 438, 439, 440, 441, 444, 456, 459, 460, 464, 466, 467, 468, 482, 484, 486, 494, 495, 513, 514, 519, 538, 541, 546, 551, 555, 581, 589, 595, 597, 625, 646, 761, 762, 763, 764, 765, 767, 769 Vieira, J. B., 234, 443 Vieira, R. X., 538, 540 Viken, R. J., 646 Vila, J., 433, 554 Viljoen, J. L., 688, 694, 695, 732, 738, 741 Viljoen, S., 206 Vincent, G. M., 45, 47, 55, 62, 147, 285, 483, 486, 495, 496, 532, 552, 573, 612, 639, 640, 682, 689, 693, 694, 700, 711, 732, 736, 738, 739, 741, 742 Vincent, N. M. P., 213 Vinton, K., 393 Virkkunen, M., 152, 518 Visher, C., 665 Visscher, P. M., 35, 150, 343, 344, 347 Visser, B. A., 179, 226, 227, 228, 670 Vitacco, M. J., 45, 59, 61, 62, 63, 66, 147, 157, 228, 229, 286, 463, 479, 486, 540, 556, 612, 624, 639, 687, 691, 692, 693, 694, 695, 721 Vitale, J. E., 46, 62, 80, 81, 85, 101, 390, 433, 489, 493, 509, 510, 511, 512, 513, 514, 516, 520, 521, 522, 537, 550, 551, 556, 557, 612, 690, 700 Vitaro, F., 458, 614 Vivian, S. E., 220

Vogel, E. K., 86 Vohs, K., 46, 47, 532, 536, 542, 612 Volkow, N. D., 381, 383, 426, 644, 645 Völlm, B., 385, 509 von Eye, A., 107 von Knorring, L., 541, 542, 550 Voracek, M., 263 Voss, W. D., 85, 557, 767 Votruba-Drzal, E., 672 Vrieze, S. I., 12, 35, 344, 346, 347, 495 Vrij, A., 196 Vucetic, Z., 393 Wagar, B. M., 427 Wagner, A. R., 405, 410, 411 Wai, M., 589 Waid, W. M., 424 Walder, L. O., 457 Waldman, I. D., 50, 58, 173, 176, 177, 281, 335, 338, 340, 341, 342, 345, 346, 425, 461, 465, 488, 491, 492, 495, 519, 597, 646, 648, 762, 767 Waldron, H., 371 Walker, D., 650 Walker, D. L., 98 Walker, L. J., 494, 589 Walker-Matthews, S., 692 Wall, T. D., 132, 133, 156, 171, 172, 178, 236, 238, 239, 248, 250, 423, 436, 756 Wallace, A. K., 693 Wallace, G. L., 402, 403 Wallace, J. F., 66, 80, 81, 82, 84, 88, 617 Waller, N., 24, 231, 262, 269 Waller, N. G., 129, 167, 170, 171, 172, 424, 433, 638, 642, 643 Waller, R., 149, 153, 154, 483, 491, 760, 762 Wallinius, M., 695 Walsh, J. A., 461 Walsh, T., 612, 733 Walsh, T. C., 648 Walsh, T. M., 492 Walsh, Z., 41, 314, 321, 550, 556, 593, 594, 595, 599, 612, 614, 626, 639, 650, 692, 697, 733, 734 Walters, B. K., 16, 443, 570, 572, 576 Walters, G. D., 9, 42, 45, 46, 63, 512, 513, 553, 590, 617, 664, 665, 667, 683, 685, 689, 690, 695, 717, 738, 740, 742, 743 Wampler, M., 363 Wan, L., 433, 520 Wang, F., 648 Wang, P., 554 Wang, W., 341, 381 Warbin, R. W., 219 Warburton, J., 371 Ward, J. H., 305 Ward, T., 718 Warden, D., 152, 405, 494, 546, 554 Wareham, J., 145, 489, 519, 540, 640, 696 Warnken, W., 698 Warren, J. I., 52, 510, 511, 512, 514, 516 Warren, J. L., 541 Waschbusch, D. A., 460, 461, 492, 494, 624, 625 Washburn, J. J., 484 Wasserman, A. L., 148, 364, 686, 736

Wasserman, G. A., 372 Wasylkiw, L., 216 Watkins, E. R., 642 Watkins, M. M., 216 Watson, D., 18, 53, 95, 96, 99, 129, 170, 199, 200, 215, 261, 263, 424, 481, 641 Watt, B. D., 228, 545, 550 Watt, K. A., 483 Watts, A., 512 Watts, A. L., 10, 54, 165, 166, 169, 172, 173, 175, 176, 177, 230, 263, 426, 576, 586, 589, 595, 769 Way, B. M., 342 Weaver, T., 47 Webb, W. W., 232 Weber, M., 165 Webster, C., 56 Webster, C. D., 617, 682, 683, 684, 698, 741 Webster, G. D., 220, 589, 670 Webster-Stratton, C., 371 Wedin, I., 688 Wee, S., 589 Weidacker, K., 431 Weiler, B. L., 363, 512, 514, 519 Weinberg, A., 646 Weinberger, J., 40 Weiner, M., 592 Weir, J. M., 464, 509, 553, 690, 719, 741 Weishaar, M., 716 Weiskopf, D. A., 86 Weiss, K., 612, 674 Weisz, J. R., 358 Weizmann-Henelius, G., 197, 198, 510, 511, 512, 514, 673 Welch, W. T., 342 Welker, K. M., 59, 61, 62 Wells, L. E., 364 Welsh, B. C., 370 Welsh, J. L., 695 Werner, N. E., 515 Wershler, J. L., 694 Wersinger, S. R., 342 West, D. J., 355, 356, 358, 359, 365, 366, 368 Westberg, L., 343 Westen, D., 40, 284 Westerlaken, K. M., 596 Westerman, J., 538 Wexler, A., 688 Wexler, M. N., 588 Whalen, C. K., 134 Whalen, P. J., 425, 435 Wheaton, J., 666 Wheeler, S., 230 White, C. D., 263, 645 White, H. R., 359, 519 White, J. L., 595 White, J. W., 618, 669 White, N. A., 515 White, S. F., 50, 100, 111, 151, 152, 391, 401, 404, 405, 406, 408, 411, 412, 414, 425, 438, 439, 464, 483, 493, 494, 495, 555, 721, 756, 764, 769 White, T. L., 65 White-Hamon, L. S., 571 Whitehead, A., 151 Whiteside, S., 220, 593 Whiteside, S. P., 263

Whitman, L. A., 550, 555, 640 Widiger, T. A., 10, 12, 13, 22, 39, 46, 48, 49, 50, 52, 53, 54, 55, 58, 68, 132, 157, 167, 169, 170, 175, 177, 178, 179, 180, 225, 236, 237, 238, 250, 263, 264, 265, 269, 270, 271, 275, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 299, 326, 372, 424, 461, 541, 590, 593, 599, 641, 643, 756, 758 Widom, C. S., 166, 217, 218, 363, 364, 492, 510, 512, 514, 519, 585, 587, 593, 594, 595 Widows, M. R., 9, 88, 131, 147, 167, 168, 212, 220, 231, 232, 276, 284, 287, 291, 292, 302, 384, 423, 589, 615, 637, 742, 755, 758 Wiebe, R. P., 589 Wiemann, S., 178 Wiers, R. W., 644 Wiggins, J. S., 250, 260, 261, 588 Wightman, R. M., 341 Wiig, J. K., 27 Wijers, A. A., 86 Wikkelso, C., 383 Wiklund, G., 540 Wikström, P.-O. H., 367 Wilbarger, J. L., 426 Wilbur, R. R., 152 Wilhelmsen, K. C., 343 Wilkowski, B. M., 263 Willcutt, E. G., 105, 106, 107, 109, 413 Willemsen, J., 44, 533, 543, 550, 614 Williams, C. L., 220 Williams, J., 283 Williams, J. B. W., 232, 282, 356, 669, 758 Williams, K., 68, 266 Williams, K. M., 59, 61, 166, 225, 227, 229, 230, 250, 276, 520, 594, 620, 668,670 Williams, W. C., 151, 404, 406, 439 Williamson, P. R., 151 Williamson, S., 84, 494, 520, 553 Williamson, S. E., 51, 89, 249, 614, 617, 697 Willimon, B., 591 Willoughby, A. R., 430, 520 Willoughby, M. T., 485, 624 Wilson, C., 682 Wilson, D. B., 719 Wilson, D. L., 512, 517 Wilson, J. Q., 299, 456 Wilson, K., 55, 494, 554 Wilson, L., 58, 61, 178, 222, 225, 240, 241, 242, 243, 244, 264, 269 Wilson, M., 760 Wilson, M. J., 59, 537, 545, 639 Wilson, M. S., 594 Wilson, N. J., 716 Wimalaweera, S., 151, 155, 346, 406, 439, 466, 493, 553, 720, 763 Wimbush, D. D., 370 Windle, M., 537 Wingate, L. R., 13 Winick, C., 643 Winkielman, P., 426 Winokur, G., 636 Wipprecht, G., 648 Wirth, R. J., 485

## 802

Wise, R. A., 97 Wise, S. P., 426 Wise, T. N., 135 Witkiewitz, K., 465, 650, 693, 762, 763 Witt, E. A., 222, 245, 246, 671 Wodushek, T., 624 Woermann, F. G., 382, 384 Wolf, E. J., 536 Wolf, R. C., 51, 85, 86 Wolfe, J., 715, 738 Wolfe, T., 30, 165, 176 Wolfgang, M. H., 23 Wolford-Clevenger, C., 621 Wong, M. T., 383 Wong, S., 513, 538, 554, 612, 614, 683, 686, 697, 698, 699 Wong, S. C., 557, 720 Wong, S. C. P., 47, 55, 62, 312, 324, 595, 665, 667, 710, 712, 713, 714, 715, 716, 717, 720, 738, 740 Wong, S. P., 612, 684, 691, 692, 695, 699,700 Wood, P. K., 638, 643 Woodman, G. F., 86 Woods, P. R., 596 Woodworth, M., 44, 458, 494, 574, 612, 616, 617, 618, 619, 620, 622, 625, 673 Woodworth, M. T., 47, 55, 443, 495, 573, 611, 622, 697 Woody, G. E., 637 Wootton, J. M., 359, 485, 595, 625 Worley, C., 370, 496, 715, 738 Wormith, J. S., 56, 688, 714, 741 Worthy, D. A., 134, 426, 672 Wright, A. G. C., 264, 298 Wright, J. P., 341 Wright, M. J., 648 Wu, H., 488 Wu, T., 341, 648 Wu, Z., 341 Wupperman, P., 63 Wygant, D. B., 53, 54, 132, 134, 170, 171, 175, 212, 235, 239, 246, 291, 423, 587, 598, 755, 756, 758, 759, 766, 768, 771

# Author Index

Xu, F., 483

Xu, J., 648 Xu, Y., 458 Yamagata, S., 262 Yamagishi, T., 597 Yancey, J. R., 17, 103, 137, 235, 429, 431, 433, 434, 637, 760, 767, 769 Yang, J., 35, 150, 343, 344 Yang, M., 47, 341, 529, 543, 593, 612, 618, 639, 684, 687, 690, 691, 693, 695, 698, 699, 712, 717, 740, 742 Yang, Y., 50, 54, 62, 89, 380, 381, 382, 383, 385, 387, 388, 391, 393, 402, 403, 587, 596, 645 Yaralian, P. S., 385 Yarbrough, J. D., 194 Yasik, A. E., 135 Yau, S. Y., 393 Yau, W. Y., 411 Yeager, C., 30, 165 Yeh, M. T., 595 Yeomans, M., 667 Yeschke, C. L., 192 Yessine, A. K., 713, 725 Yi, R., 650 Yiend, J., 390 Yildirim, B. O., 518 Yoder, K. J., 151, 405 Yoon, J., 484, 664 Yorker, B. C., 572 Young, J. E., 716 Young, K. A., 433, 520 Young, S., 342 Young, S. E., 104, 105, 107, 110, 129, 130, 136, 138, 341, 414, 427, 429, 431, 637, 646, 767 Young, W. S., 342 Youngstrom, E., 464, 498, 693, 763 Youngstrom, J. K., 464, 498, 693, 763 Yu, L., 458 Yu, R., 409 Yuille, J. C., 42, 47, 621, 668 Yurgelun-Todd, D. A., 387 Yutzey, D. A., 391

Zagon, I. K., 512, 513 Zahn-Waxler, C., 484, 760 Zai, C. C., 150, 343, 495 Zakireh, B., 666 Zalewski, M., 647 Zalot, A. A., 482, 483 Zamble, E., 690 Zanarini, M., 283 Zanna, M. P., 484 Zapolski, T. C. B., 61, 643 Zeffiro, T. A., 151 Zeichner, A., 58, 84, 178, 225, 240, 269, 270, 447, 593, 611, 614, 621 Zeier, J., 51, 54, 85, 89, 406 Zeigler-Hill, V., 176 Zelson, M. F., 432 Zempolich, K. A., 363, 458, 622, 697 Zezza, N., 648 Zhang, H., 648 Zhang, T., 690 Zhang, W., 482 Zhang, Z., 692 Zhang, Z. H., 647 Zheng, M., 104, 646 Zhong, R., 740 Zickar, M. J., 600 Ziegler, S., 434 Zimak, E. H., 593, 594 Zimbardo, P., 28 Zimmer-Gembeck, M. J., 371 Zimmerman, M., 284 Zinbarg, R. E., 536 Zinger, I., 732, 735, 738 Ziskind, E., 424, 434 Zlatar, Z. Z., 434 Zoob, I., 217 Zubieta, J. K., 411 Zubin, J., 645 Zucker, R. A., 411, 636, 643 Zuckerman, M., 217, 390, 535, 557 Žukauskienė, R., 59, 536 Zwets, A. J., 59 Zyphur, M. J., 692

# Subject Index

Note. f, n, or t following a page number indicates a figure, a note, or a table.

Abuse, 324, 358, 363-364, 392, 519. See also Child maltreatment Academic functioning, 36, 105-106, 113, 358 Achievement, 260, 262, 262t, 265t, 267t, 273t, 274f, 288-289 Activity, 265t, 267t, 272t, 274f Activity Preference Questionnaire, 217 Acute threat response, 409-410, 409f, 414f. See also Fear; Fear reactivity; Threat sensitivity Adaptation boldness and, 166, 181 successful psychopathy and, 590, 591-592, 596, 597, 598 Addiction, 16, 97, 134. See also Substance use disorders (SUDs) Adolescence aggression and, 624-625 callous-unemotional traits and, 463-469 cultural variations in psychopathology and, 537-541, 539t developmental pathways to conduct problems and, 463-469 externalizing disorders in childhood and adolescence, 104-110 onset of conduct problems and, 459-460 pathways to psychopathy and, 110-115 Psychopathy Checklist: Youth Version (PCL:YV), 45 recidivism and, 693-694 substance use disorders and, 639-640 treatment and, 719-725, 722t-723t undersocialized and socialized subgroups of antisocial youth, 462-463 See also Youth psychopathy

Adoption studies, 335-337, 337t, 353, 393. See also Environmental factors; Genetic factors; Twin studies Adulthood, 100-104, 594-595, 639, 712-718, 725-726 Adventure seeking, 223t, 228t, 239t, 485 Aesthetics, 265t, 267t, 272t, 274f Affective factor (of psychopathy) affect dysregulation, 134, 135 affect startle modulation studies, 432-434 aggression and, 622 assessment and, 736-737 child abuse and neglect and, 363 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 202 cultural variations in psychopathology and, 540, 551 Elemental Psychopathy Assessment (EPA) and, 241t integrative approach and, 771 interpersonal features, 100, 431 overview, 447n pain processing and, 440 peer, school, and neighborhood factors, 368 processing systems and, 437-439 psychopathy and, 300, 597 Psychopathy Checklist-Revised (PCL-R) and, 43, 43t, 44f, 50-52, 60f, 62, 62f, 64-67, 65f, 66f, 67f recidivism and, 700 serial murderers and, 573-574, 577t, 579, 580 sexual coercion and, 664, 667 substance use disorders and, 639 Triarchic Psychopathy Measure (TriPM) and, 247

variants of psychopathy and, 322t, 326, 327 - 328youth psychopathy and disruptive behavior disorders, 484-485, 491 Affective processing, 84-86, 444-447, 520-521. See also Emotional processing; individual processes Affiliation affiliative capacity, 17, 115 callous-unemotional traits and, 150 - 151externalizing proneness and, 127, 136 integrative approach and, 771 psychopathy and, 114, 590 serial murderers and, 582 temperament dimensions and, 118 Aggression antisocial personality disorder (ASPD) and, 8, 22 assessment and, 758 boldness and, 175 brain deficits and impairments, 389, 390 callous-unemotional traits and, 150-151 cognitive and emotional processing and, 445 comorbidity between conduct disorder and attention-deficit/hyperactivity disorder and, 462 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 202 criminality and, 28 dual-disposition model and, 13, 15-16 Elemental Psychopathy Assessment (EPA) and, 244t externalizing spectrum model and, 133f

## 804

Aggression (cont.) female psychopathy and, 515, 522 genetic factors and, 342-343 high-level cognitive mechanisms and, 427 integrated emotion systems approach and, 409-410 Levenson Self-Report Psychopathy Scale (LSRP) and, 223t link between psychopathy and, 611-612 mental illness and, 626 mixed motivations for, 612-613 neurological factors and, 382, 386-387, 388, 414f, 765-766 overview, 64, 611, 626-627 pathways to psychopathy and, 115 peer, school, and neighborhood factors, 368 psychopathy and, 40, 594, 595, 598 Psychopathy Checklist-Revised (PCL-R), 62, 64-65, 65f reactive and instrumental forms of, 613-617 recidivism and, 697 self-directed aggression, 522, 620-624 self-gratifying aspects of, 617-620 self-report measures and, 250 Self-Report Psychopathy scale (SRP) and, 228t sexual coercion and, 664, 668, 672-673 structural models of personality and, 260, 261, 262, 262t, 263 substance use disorders and, 642 subtypes of psychopathy, 457-459, 623 temperament dimensions and, 101, 103-104 trait-based approaches and, 302, 303 treatment and, 718 Triarchic Psychopathy Measure (TriPM) and, 239t undersocialized and socialized subgroups of antisocial youth, 462-463 unitary mechanism model and, 11 variants of psychopathy and, 321, 323t. 326 youth psychopathy and disruptive behavior disorders, 481, 484, 495-496, 624-625 Aggression Replacement Training program, 721 Aggressive Behavior Control program, 712 Agreeableness attention-deficit/hyperactivity disorder (ADHD) and, 106-107 boldness and, 172-173, 177 cultural variations in psychopathology and, 552 Elemental Psychopathy Assessment (EPA) and, 240, 243t externalizing psychopathology factor and, 132, 135-136 five-factor model (FFM) and, 264, 266, 274 Levenson Self-Report Psychopathy Scale (LSRP) and, 222t-223t

## Subject Index

narcissistic personality disorder (NPD)

and, 288 personality disorders and, 275 Psychopathic Personality Inventory (PPI) and, 233t psychopathy and, 114, 326 Self-Report Psychopathy scale (SRP) and, 225, 227t structural models of personality and, 261.263 subscale-level differences and, 271 substance use disorders and, 641 successful psychopathy and, 593 temperament dimensions and, 96, 100 Triarchic Psychopathy Measure (TriPM) and, 238t Agreeableness-antagonism, 94 Akaike information criterion (AIC), 337 Alabama Parenting Questionnaire, 359 Alcohol abuse and dependence cognitive and emotional processing and, 445 Elemental Psychopathy Assessment (EPA) and, 244t externalizing proneness and, 129, 134-135 genetic factors and, 341-342 Levenson Self-Report Psychopathy Scale (LSRP) and, 223t overview, 289, 636 Self-Report Psychopathy scale (SRP) and, 228t successful psychopathy and, 593 temperament dimensions and, 94, 101 youth psychopathy and disruptive behavior disorders, 494 See also Addiction; Substance use disorders (SUDs) Alienation, 260, 262, 262t, 615 Altruism five-factor model (FFM) and, 265t, 267t, 274f socialization and, 26 structural models of personality and, 261 subscale-level differences and, 273t Triarchic Psychopathy Measure (TriPM) and, 239t Amygdala affect startle modulation studies and, 435 boldness and, 170 callous-unemotional traits and, 151 core affect processing system and, 425, 426 cultural variations in psychopathology and, 554-555 developmental pathways to conduct problems and, 466 disinhibition and, 430 fearful faces and, 61 high-level cognitive mechanisms and, 428 integrated emotion systems approach and, 404, 404f, 405-406, 407f, 408, 409, 409f neuroimaging and, 764-765 overview, 61, 383-385, 414

pain processing and, 440 paralimbic hypothesis, 402-403 psychopathy and, 388, 596 reactivity and, 438-439 Self-Report Psychopathy scale (SRP) and, 230t sexual coercion and, 672 temperament dimensions and, 98 youth psychopathy and disruptive behavior disorders, 493, 494-495 Analytic method, 304-307 Anatomical magnetic resonance imaging (aMRI) brain deficits and impairments, 392 different forms of psychopathy and, 387-388 neuroanatomical features and, 382, 383, 384, 386 overview, 380 See also Neuroimaging technologies Anger aggressive behavior and, 458 cognitive and emotional processing and, 445 criminality and, 28 dual-disposition model and, 13 five-factor model (FFM) and, 265t, 267t, 274f integrated emotion systems approach and, 404 pain processing and, 440 psychopathy and, 113, 115, 300 structural models of personality and, 260 subscale-level differences and, 271, 272t temperament dimensions and, 96 trait-based approaches and, 302 variants of psychopathy and, 321, 323t, 326 Antagonism antisocial personality disorder (ASPD) and, 284 clinical interviews and, 194 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 201, 202 criminality and, 286–287 Elemental Psychopathy Assessment (EPA) and, 240 externalizing spectrum model and, 132 five-factor model (FFM) and, 270 narcissistic personality disorder (NPD) and, 288 overview, 10 pathways to psychopathy and, 115 Self-Report Psychopathy scale (SRP) and, 227t structural models of personality and, 261 subscale-level differences and, 272t-273t successful psychopathy and, 596-597, 598 temperament dimensions and, 96, 100, 103-104 Triarchic Psychopathy Measure (TriPM) and, 238t See also Callousness; Meanness

Anterior cingulate cortex (ACC) core affect processing system and, 426 high-level cognitive mechanisms and, 428 integrated emotion systems approach and, 406 pain processing and, 440, 440-441 paralimbic hypothesis, 402, 403 sexual coercion and, 672 social attachment and, 443 substance use disorders and, 644-645, 646 temperament dimensions and, 103 Anterior insula cortex, 406, 407f, 410-411, 426, 443 Antisocial behavior aggression and, 615 causes of, 27-29, 29f cognitive and emotional processing and, 445 criminality and, 287 developmental processes and, 456-457 Elemental Psychopathy Assessment (EPA) and, 244t endophenotypes for, 345-346 family factors and, 358 female psychopathy and, 514-515, 515 five-factor model (FFM) and, 274 genetic factors and, 340-343, 342-344 "madness" of psychopathy and, 7 narcissistic personality disorder (NPD) and, 287-288 onset of conduct problems in childhood and adolescence and, 459,460 pathways to psychopathy and, 112, 113 psychopathy and, 40, 298, 300 Psychopathy Checklist-Revised (PCL-R) and, 49-50 recidivism and, 697 sexual coercion and, 669 successful psychopathy and, 591, 595, 597 temperament dimensions and, 117, 118 trait-based approaches and, 302 twin studies and, 335-337, 337t variants of psychopathy and, 326 See also Antisocial factor (of psychopathy); Delinquency Antisocial factor (of psychopathy) child abuse and neglect and, 363 clinical interviews and, 194 deviance and, 6, 495-496 externalizing spectrum model and, 132 - 133female psychopathy and, 522 genetic factors and, 338 peer, school, and neighborhood factors, 368 Psychopathy Checklist-Revised (PCL-R), 43, 43t, 44f, 60f, 62, 62f, 63, 64-67, 65f, 66f, 67f recidivism and, 689 serial murderers and, 577t sexual coercion and, 664, 665-666 substance use disorders and, 639 successful psychopathy and, 588, 589, 590, 591, 592, 598 See also Antisocial behaviors; Antisocial personality; Antisocial personality disorder (ASPD)

Antisocial Features (ANT) scale, 685, 742-743 Antisocial parents, 358, 363-364, 365-366. See also Parental factors; Parenting Antisocial personality family factors and, 359 genetic factors and, 36-37 Lykken's thesis and, 33-34 overview, 24-25, 24f, 25f youth psychopathy and disruptive behavior disorders, 496 See also Antisocial factor (of psychopathy); Antisocial personality disorder (ASPD); Personality Antisocial personality disorder (ASPD) affect startle modulation studies and, 435 assessment and, 756-759 boldness and, 170, 171-172, 175, 177, 178, 179, 181 brain deficits and impairments, 392 criminality and, 31n, 285-287 cultural variations in psychopathology and, 541 Elemental Psychopathy Assessment (EPA) and, 242t externalizing disorders and, 289-290 externalizing psychopathology factor and, 133-134, 289-290 female psychopathy and, 515, 515-516 five-factor model (FFM) and, 275 genetic factors and, 343-344 internalizing disorders and, 290-291 Lykken's thesis and, 33-37, 35f narcissistic personality disorder (NPD) and, 288-289 neuroanatomical features and, 381-383 overview, 8, 22-23, 40-41, 282-285, 289.298-299 Psychopathy Checklist-Revised (PCL-R) and, 39, 52-55, 69n role of psychopathy in the legal system and, 734 self-report measures and, 218, 248 serial murderers and, 574 sexual coercion and, 663 substance use disorders and, 289, 638, 641 temperament dimensions and, 94, 101 trait-based approaches and, 301-302, 303 triarchic model and, 246-247 Triarchic Psychopathy Measure (TriPM) and, 238t twin studies and, 336 variants of psychopathy and, 297, 321, 327 See also Antisocial personality Antisocial Process Screening Device (APSD) aggression and, 615, 624-625 callous-unemotional traits and, 145, 147.148 cultural variations in psychopathology and, 538, 539-541, 546t-549t, 550-551, 552, 557

family factors and, 366 female psychopathy and, 510, 521 genetic factors and, 339, 340 integrative approach and, 768-769 overview, 9, 68n, 423 peer, school, and neighborhood factors, 368 recidivism and, 693-694 Self-Report Psychopathy scale (SRP) and, 226t social attachment and, 442 trait-based approaches and, 303 treatment and, 715-716, 722t-723t Triarchic Psychopathy Measure (TriPM) and, 237t-238t variants of psychopathy and, 424-425 youth psychopathy and disruptive behavior disorders, 486, 487-488, 490, 494, 497, 624-625 Antisocial Process Screening Device Self-Report Version (APSD-SR), 490, 693 Antisociality comorbidity between conduct disorder and attention-deficit/hyperactivity disorder and, 461 cultural variations in psychopathology and, 556, 557-558 Elemental Psychopathy Assessment (EPA) and, 241t female psychopathy and, 517 Levenson Self-Report Psychopathy Scale (LSRP) and, 223t neuroanatomical features and, 382-386 pain processing and, 440 Self-Report Psychopathy scale (SRP) and, 228t sexual coercion and, 668, 670 Anxiety/anxiousness anxiety response, 11 anxious-depressive tendencies, 7, 8, 13. 18n assessment and, 758 attention-deficit/hyperactivity disorder (ADHD) and, 106 boldness and, 168, 174, 179-180 callous-unemotional traits and, 155-156 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 202 cultural variations in psychopathology and, 551, 556 demoralization and, 214-215 developmental pathways to conduct problems and, 459, 465 dual-disposition model and, 14 externalizing psychopathology factor and, 129, 134-135 five-factor model (FFM) and, 265t, 267t, 274f internalizing disorders and, 290-291 Levenson Self-Report Psychopathy Scale (LSRP) and, 222t "mask" concept and, 5–6 personality disorders and, 275

distress cues and, 437-438

### 806

#### Anxiety/anxiousness (cont.) psychopathy and, 111, 114, 300, 309, 324, 597 Psychopathy Checklist-Revised (PCL-R) and, 50-52, 62 recidivism and, 696-697 Self-Report Psychopathy scale (SRP) and, 227t social attachment and, 442 structural models of personality and, 260 subscale-level differences and, 271, 272t temperament dimensions and, 94, 96-97.101 treatment and, 718 Triarchic Psychopathy Measure (TriPM) and, 238t youth psychopathy and disruptive behavior disorders, 481 Anxious attachment style, 239t Approach, 97, 106 Approach-avoidance situations, 300 Arousal aggression and, 614, 619 boldness and, 170 brain deficits and impairments, 390 callous-unemotional traits and, 152 - 153recidivism and, 697 response modulation hypothesis (RMH) and, 81, 82f temperament dimensions and, 98 Arrogance criminality and, 286-287 Elemental Psychopathy Assessment (EPA) and, 240 narcissistic personality disorder (NPD) and, 287-288 psychopathy and, 115, 483-484, 513 structural models of personality and, 2.61 Assertiveness dual-disposition model and, 13 five-factor model (FFM) and, 265t, 267t, 269, 274f personality disorders and, 275 subscale-level differences and, 272t temperament dimensions and, 101 variants of psychopathy and, 324 Assessment aggression and, 615 callous-unemotional traits and, 145-148, 155, 156n-157n cross-domain assessment initiatives, 759-760 cultural variations in psychopathology and, 529-530, 531, 535 dual-disposition model and, 15 ethical standards and guidelines and, 735-746 family factors and, 372-373 fear and anxiety and, 50-51, 52 female psychopathy and, 510-512 five-factor model (FFM) and, 268-270, 271, 274 future directions, 755-760

in legal contexts, 736-739

## Subject Index

overview, 292, 772n pathways to psychopathy and, 113 PCL scales and, 41-42 recidivism and, 684-687 risk assessment, 46-47 sexual coercion and, 666-668 substance use disorders and, 637-638 successful psychopathy and, 599 youth psychopathy and disruptive behavior disorders, 483-496 See also Clinical interviews; individual measures and tools Attachment callous-unemotional traits and, 153 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 202, 203f family factors and, 359, 363 pathways to psychopathy and, 113, 115 recidivism and, 698 sexual coercion and, 672 social attachment, 442-443 trait-based approaches and, 303 Triarchic Psychopathy Measure (TriPM) and, 239t Attention bottleneck (AB), 86-88, 87f Attention seeking, 271, 758 Attentional functioning, 83-86, 88-89, 407-409, 408f, 519-520, 521, 522 Attention-deficit/hyperactivity disorder (ADHD) affect-processing systems and, 438 callous-unemotional traits and, 151, 152,468 comorbidity between conduct disorder and, 460-462 core affect processing system and, 426 dual-disposition model and, 16 endophenotypes for antisocial behavior and, 345-346 executive functions and, 98, 99 externalizing psychopathology factor and, 104-110, 130, 134-135 genetic factors and, 340-342, 344 integrated emotion systems approach and, 411-412, 413-414 neurological factors and, 401 pathways to psychopathy and, 110-115 reward sensitivity and, 411-412 temperament dimensions and, 94-95, 102-103, 116-117, 118 youth psychopathy and disruptive behavior disorders, 480-486, 495 Attention-focused models, 80-81. See also Response modulation hypothesis (RMH) Aversive events, 81, 82f Avoidance behavior cognitive and emotional processing and, 445 female psychopathy and, 521 neurological factors and, 414f psychopathy and, 300 social attachment and, 442 temperament dimensions and, 96-97 treatment and, 718 youth psychopathy and disruptive behavior disorders, 493

Balloon Analogue Risk-Task (BART), 594 Bayesian information criterion (BIC), 306.307 Beck Depression Inventory, 516 Behavior genetics studies, 129, 646. See also Genetic factors Behavioral activation system (BAS) attention-deficit/hyperactivity disorder (ADHD) and, 106, 109 psychopathy and, 300 Psychopathy Checklist-Revised (PCL-R), 65, 67 sexual coercion and, 671 temperament dimensions and, 97, 115 - 116Behavioral disinhibition, 107-108, 431. See also Disinhibition Behavioral functioning approach and, 227t brain deficits and impairments, 390-392 cognitive and emotional processing and, 444-445 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 202, 203f, 204 control and, 270-271 cultural variations in psychopathology and, 553-555 deviance and, 4-6, 5t, 10-11, 218-219 Elemental Psychopathy Assessment (EPA) and, 243t-244t family factors and, 360f-362t female psychopathy and, 513-514 integrative approach and, 770 Levenson Self-Report Psychopathy Scale (LSRP) and, 223t onset of conduct problems in childhood and adolescence and, 459 recidivism and, 698 Self-Report Psychopathy scale (SRP) and, 228t-229t social attachment and, 443 Behavioral inhibition attention-deficit/hyperactivity disorder (ADHD) and, 107, 109-110 developmental pathways to conduct problems and, 465, 466-467 Levenson Self-Report Psychopathy Scale (LSRP) and, 223t psychopathy and, 300 Self-Report Psychopathy scale (SRP) and, 228t temperament dimensions and, 94, 97-98, 99-100, 103, 115-116, 117-118 Triarchic Psychopathy Measure (TriPM) and, 239t See also Inhibition Behavioral Inhibition Scale (BIS), 66 - 67Behavioral interventions, 135-136 Behavioral reactivity, 437-439 Bidirectional process, 112-113 Bifactor model callous-unemotional traits and, 146 Externalizing Spectrum Inventory (ESI) and, 130-131

Psychopathy Checklist—Revised (PCL-R), 42-43, 43t, 44f, 63 substance use disorders and, 642 Big Five Inventory (BFI), 225 Big Five temperament dimensions, 114, 261. See also Temperament Big Four model, 96, 100, 261 Big Three model, 96, 100, 261 Big Two model, 261 Biobehavioral constructs, 16-17, 97-98 **Biological** factors callous-unemotional traits and, 156 endophenotypes for antisocial behavior and, 345-346 externalizing proneness and, 135-136, 138 sexual coercion and, 672 youth psychopathy and disruptive behavior disorders, 494-495 See also Neurological factors Biometric modeling analyses, 104-105, 336-337 Biometric structural analysis, 104-105 Birth complications, 392-393 Blame Externalization boldness and, 167, 168 genetic factors and, 338 Levenson Self-Report Psychopathy Scale (LSRP) and, 223t Self-Report Psychopathy scale (SRP) and, 228t sexual coercion and, 671 trait-based approaches and, 302 Blood oxygen level-dependent (BOLD) responses, 404, 764 Boldness aggression and, 615 assessment and, 758, 759-760 biobehavioral trait approach and, 17 cognitive and emotional processing and, 446 criticisms of, 174-175 dual-disposition model and, 13-15, 16 - 17externalizing spectrum model and, 132-133, 133f five-factor model (FFM) and, 276 internalizing disorders and, 291 maladaptive features of, 175-177 nomological network and, 170-174 overview, 17, 165-170, 180-181, 431-436 psychopathy and, 114-115, 177-180, 324-325, 327, 592, 598, 599 recidivism and, 698 serial murderers and, 573 social attachment and, 442 subscale-level differences and, 271 temperament dimensions and, 100-101, 103-104 trait-based approaches and, 303, 304f Triarchic Psychopathy Measure (TriPM) and, 235, 247 unitary mechanism model and, 10-11 youth psychopathy and disruptive behavior disorders, 491 See also Fearless Dominance (FD) factor; Fearlessness

Borderline personality disorder (BPD) boldness and, 171, 174 dual-disposition model and, 16 Elemental Psychopathy Assessment (EPA) and, 242t female psychopathy and, 515, 516, 517, 518 overview, 301 treatment and, 718 variants of psychopathy and, 309 Borderline symptoms, 194, 445 Boredom, 485, 597 Bottom-up control, 106, 107, 200, 427-428 Brain activation, 80, 137 Brain anatomy, 380-387. See also Neuroanatomical features; Neurological factors Brain imaging. See Neuroimaging technologies Brain injury/damage, 389-394. See also Neuroanatomical features B-Scan, 58, 68n Bundy, Theodore (Ted), 166-167, 577-580, 577t, 581. See also Serial murder Business Scan 360, 58 Business Scan 360 (B-Scan 360), 68n Buss-Perry Aggression Questionnaire (BPAQ), 221 California Psychological Inventory (CPI), 232, 513 California Psychological Inventory (CPI) Socialization (So) scale, 217, 218, 513 Callous affect, 270-271, 274, 447n-448n Callous aggression externalizing psychopathology factor and, 130f, 131, 132-133, 133f pathways to psychopathy and, 115 substance use disorders and, 642 temperament dimensions and, 102 See also Callousness; Meanness Callousness antisocial personality disorder (ASPD) and, 284 assessment and, 758 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 202, 204 criminality and, 286-287 cultural variations in psychopathology and, 541, 551 dual-disposition model and, 15 Elemental Psychopathy Assessment (EPA) and, 241t integrative approach and, 769-770 PCL scales and, 41 psychopathy and, 40, 596-597 Psychopathy Checklist-Revised (PCL-R), 64-65, 68n response modulation hypothesis (RMH) and, 80 self-report measures and, 250 serial murderers and, 573, 581 sexual coercion and, 662, 670-673, 674

social attachment and, 443 subscale-level differences and, 270-271 successful psychopathy and, 598 Triarchic Psychopathy Measure (TriPM) and, 235, 247 unitary mechanism model and, 11 variants of psychopathy and, 321 youth psychopathy and disruptive behavior disorders, 484-485, 491 See also Antagonism; Callous aggression; Callous-unemotional (CU) traits; Meanness Callousness-unemotional (CU) traits aggression and, 615, 624-625, 626 assessment and, 145-148, 490 cognitive and emotional processing and, 445, 446 core affect processing system and, 426 cultural variations in psychopathology and, 539-540, 551, 554 developmental pathways to conduct problems and, 463-469, 467 diagnosis and, 468-469 distress cues and, 438, 439 externalizing spectrum model and, 131-132 female psychopathy and, 514-515, 519 future directions, 467-469, 761, 762 genetic factors and, 338, 343-344 integrative approach and, 408-409, 769 neuroanatomical features and, 382, 388 neurological factors and, 414, 414f overview, 10, 17, 144-145, 155-157, 436-444, 467-469 pain processing and, 440 psychopathy and, 111, 298-299, 595 recidivism and, 693, 700 sexual coercion and, 670 social attachment and, 442-443 stability of, 148-149 subscale-level differences and, 270-271 temperament dimensions and, 94, 100-101, 103-104, 117 trait-based approaches and, 303 treatment and, 154-155, 156, 722t-723t Triarchic Psychopathy Measure (TriPM) and, 237t vulnerabilities to, 149-154 youth psychopathy and disruptive behavior disorders, 481, 482, 484, 486, 490, 492, 493, 494, 495, 497, 498, 624-625, 762-763 See also Callousness; Meanness Cambridge Study in Delinquent Development (CSDD) child abuse and neglect and, 363 family factors and, 359, 366 large family size and, 365 overview, 355-357 parental conflict and disrupted families and, 364-365 peer, school, and neighborhood factors, 368-369 risk factors, 369 socioeconomic status and, 367-368 teenage parents and, 367
CAPP Informant Rating Form, 205. See also Comprehensive Assessment of Psychopathic Personality (CAPP) Carefree Nonplanfulness, 167, 168, 338 Caudate, 410, 410f, 425 Causal mechanisms brain functioning and, 389-394 crime, 27-29, 29f dual-disposition model and, 16-17 family factors and, 373 onset of conduct problems in childhood and adolescence and, 459-460 treatment and, 725-726 Charm internalizing disorders and, 291 "mask" concept and, 4-5, 8 Psychopathy Checklist-Revised (PCL-R) and, 48 sexual coercion and, 664, 670, 671 successful psychopathy and, 585 youth psychopathy and disruptive behavior disorders, 483-484 Cheating, 229t, 594, 664 Child Behavior Checklist (CBCL), 156n-157n, 336, 488 Child maltreatment brain deficits and impairments, 392 female psychopathy and, 519 onset of conduct problems in childhood and adolescence and, 459 overview, 363-364 thrill seeking and, 618 variants of psychopathy and, 324 See also Abuse; Neglect; Physical abuse; Sexual abuse Child Problematic Traits Inventory (CPTI), 486, 489, 540 Child Psychopathy Scale (CPS) cultural variations in psychopathology and, 538, 552 genetic factors and, 339 overview, 68n Triarchic Psychopathy Measure (TriPM) and, 237t youth psychopathy and disruptive behavior disorders, 486, 488 Child skills training, 371 Childhood aggression and, 624-625 callous-unemotional traits and, 463 - 469cultural variations in psychopathology and, 537-541, 539t developmental pathways to conduct problems and, 463-469 dual-disposition model and, 15-16 externalizing disorders in childhood and adolescence, 104-110 mental illness and, 128 onset of conduct problems and, 459-460 overview, 25-27 pathways to psychopathy and, 110-115 recidivism and, 693-694 successful psychopathy and, 598 treatment and, 719-725, 722t-723t

## Subject Index

undersocialized and socialized

subgroups of antisocial youth, 462-463 See also Youth psychopathy Childhood Psychopathy Scale (CPS), 247, 274, 540, 741 Childhood risk factors, 356. See also Risk factors Childrearing, 26-27. See also Parenting Cleckley's concept of psychopathy antisocial personality disorder (ASPD) and, 282 boldness and, 14-15, 169-170, 177-178 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 200 conceptualizing, 8-17 construct drift and, 48-49 criminality and, 286 cultural variations in psychopathology and, 531 dual-disposition model and, 15-16 externalizing proneness and, 127-128 fear and anxiety and, 51-52 female psychopathy and, 512 five-factor model (FFM) and, 264 internalizing disorders and, 290 "madness" of psychopathy and, 6–8 origins and development of, 4-6, 5t overview, 3-6, 5t, 8, 10, 17, 40-41, 298, 300 personality and, 259–260 predatory criminality versus, 8 psychopathy as masked externalizing psychopathology, 10-17 response modulation hypothesis (RMH) and, 80 substance use disorders and, 635-636 successful psychopathy and, 585, 590, 598 temperament dimensions and, 100-101, 116 trait-based approaches and, 301-302 unitary mechanism model and, 10-12 variants of psychopathy and, 326-327 See also "Mask" concept Clinical formulations, 48 Clinical interviews, 189-208, 203f. See also Assessment; Interview-based assessment Clinical utility, 495-496 Closing sessions, 192-193 Cluster-analytic methods clustering variables, 307 psychopathy and, 300-301, 304-307, 309, 310t-319t treatment and, 718 Coercion, sexual. See Sexual coercion Cognitive functioning aggression and, 624 callous-unemotional traits and, 153 cognitive processing system, 425-429, 444-447, 585 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 202, 203f, 204 control and, 426-428 emotion and, 428-429

empathy and, 403-404 overview, 422 recidivism and, 698 rumination and, 99 successful psychopathy and, 592, 597 temperament dimensions and, 98 youth psychopathy and disruptive behavior disorders, 492-494 Cognitive-behavioral therapy (CBT), 723t, 724 Cold emotions, 300 Coldheartedness aggression and, 615 boldness and, 167, 168, 178 Elemental Psychopathy Assessment (EPA) and, 240, 242t genetic factors and, 338 Psychopathic Personality Inventory (PPI) and, 231, 234 Self-Report Psychopathy scale (SRP) and, 225 serial murderers and, 573 social attachment and, 443 Triarchic Psychopathy Measure (TriPM) and, 236t, 247 youth psychopathy and disruptive behavior disorders, 491 See also Callousness; Meanness Coldheartedness Scale of the Psychopathic Personality Inventory-Revised (PPI-CH), 147 Collaborative Study on the Genetics of Alcoholism (COGA), 648 Common Language Version of the California Child Q-Set, 156n-157n, 488 Community settings, 687-688 Comorbidity aggression and, 621 attention-deficit/hyperactivity disorder (ADHD) and, 117, 460-462 callous-unemotional traits and, 155-156 clinical implications, 648-650 cultural variations in psychopathology and, 541, 550-551 externalizing psychopathology factor and, 104, 129 female psychopathy and, 515-517 five-factor model (FFM) and, 275 internalizing disorders and, 290-291 overview, 281, 289 psychopathy and, 299 substance use disorders and, 637-650 temperament dimensions and, 94, 116-117 Comparative fit index (CFI), 59 Competence, 178, 265t, 267t, 273t, 274f Compliance, 261, 265t, 267t, 273t, 274f Comprehensive Assessment of Borderline Personality (CABP), 206 Comprehensive Assessment of Psychopathic Personality (CAPP) administration of, 193 advantages to, 202, 204 boldness and, 172 cultural variations in psychopathology and, 531-532, 544t

ethical standards and guidelines and, 742 female psychopathy and, 518 guiding principles of, 199-200 overview, 189, 190, 194, 199-208, 203f recidivism and, 691, 697-698, 701 research support for, 205-207 Self-Report Psychopathy scale (SRP) and, 226t treatment and, 715 Conditioning, 80, 276, 300, 382, 390, 425 Conduct disorder (CD) antisocial personality disorder (ASPD) and, 22, 23 assessment of youth and, 486-496 attention-deficit/hyperactivity disorder (ADHD) and, 110, 117 callous-unemotional traits and, 463-469, 468 childhood diagnosis of, 110-115 cognitive and emotional processing and, 492 comorbidity between attention-deficit/ hyperactivity disorder and, 460-462 diagnosis and, 459, 468-469, 482-483, 757 executive control and, 107-108 externalizing psychopathology factor and, 104-105, 105, 130 future directions, 763 genetic factors and, 341-342, 343-344 integrative approach and, 406-407, 408, 411, 769 overview, 289, 755 pain processing and, 440 paralimbic hypothesis, 402 pathways to psychopathy and, 110-115 substance use disorders and, 639-640, 646 temperament dimensions and, 94 twin studies and, 336 youth psychopathy and disruptive behavior disorders, 462-463, 480-486, 498 Conduct problems aggression and, 624-625 callous-unemotional traits and, 151, 152, 156, 463-469 cultural variations in psychopathology and, 539-540, 551 externalizing spectrum model and, 132 female psychopathy and, 514-515 paralimbic hypothesis, 402 recidivism and, 693 successful psychopathy and, 595 youth psychopathy and disruptive behavior disorders, 459-460, 486, 491, 624–625 Confirmatory factor analysis (CFA) cultural variations in psychopathology and, 537, 541, 559 Fearless Dominance (FD) factor and, 174 Psychopathy Checklist-Revised (PCL-R), 43 recidivism and, 691

variants of psychopathy and, 306 youth psychopathy and disruptive behavior disorders, 490 Conning, 387, 671. See also Manipulation/ Manipulativeness Conscience development comorbidity between conduct disorder and attention-deficit/hyperactivity disorder and, 461-462 fearfulness and, 12 noncriminal psychopathy and, 30-31 overview, 436-437 pathways to psychopathy and conduct problems, 115, 465 youth psychopathy and disruptive behavior disorders, 484-485 Conscientiousness boldness and, 172-173, 177, 178 criminality and, 286-287 cultural variations in psychopathology and, 552 Elemental Psychopathy Assessment (EPA) and, 240, 243t externalizing psychopathology factor and, 132, 135-136, 289-290 five-factor model (FFM) and, 264, 266, 269, 274, 276 Levenson Self-Report Psychopathy Scale (LSRP) and, 223t narcissistic personality disorder (NPD) and, 288-289 overview, 28 personality disorders and, 275 Psychopathic Personality Inventory (PPI) and, 233t Self-Report Psychopathy scale (SRP) and, 225, 227t structural models of personality and, 261, 263 subscale-level differences and, 271 substance use disorders and, 641 successful psychopathy and, 590, 593 temperament dimensions and, 94, 96 Triarchic Psychopathy Measure (TriPM) and, 238t variants of psychopathy and, 309 Constraint attention-deficit/hyperactivity disorder (ADHD) and, 106-107 dual-disposition model and, 13 pathways to psychopathy and, 110-111, 114 Psychopathic Personality Inventory (PPI) and, 233t structural models of personality and, 260 temperament dimensions and, 95, 99-100 variants of psychopathy and, 309 Construct domain, 482–483 Construct drift, 48-49 Construct validity, 234, 541, 542t-549t, 550–559. See also Validity Content validity, 205-206. See also Validity Context-appropriate balance of attention (CABA) framework, 88-89

Contextual variables, 36, 459-460 Contingencies, 83, 385-386 Continuous, multidimensional approach, 117-118 Control attention-deficit/hyperactivity disorder (ADHD) and, 106-107 clinical interviews and, 194-196 Self-Report Psychopathy scale (SRP) and, 227t structural models of personality and, 260, 261, 262, 262t Triarchic Psychopathy Measure (TriPM) and, 238t variants of psychopathy and, 297–298 Cool systems, 98-99 Core affect processing systems, 425-426, 446 Corpus callosum, 386, 390-391 Correctional Service of Canada's Aggressive Behavior Control program, 712 Cortical system, 106, 152, 168, 518-519 Criminal justice system cultural variations in psychopathology and, 529, 531-532 family factors and, 357-358 Psychopathy Checklist: Youth Version (PCL:YV), 45 Psychopathy Checklist—Revised (PCL-R) and, 39-40, 62 risk reduction and, 716 successful psychopathy and, 587 See also Criminal offenders; Criminality Criminal offenders dual-disposition model and, 15 Psychopathy Checklist-Revised (PCL-R), 57-58 treatment and, 711-713, 717-718 variants of psychopathy and, 324 See also Criminal justice system; Criminality Criminality aggression and, 614-615, 627 antisocial personality disorder (ASPD) and, 22, 23, 31n causes of, 27-29, 29f cultural variations in psychopathology and, 532, 552-553, 556, 557-558 family factors and, 358, 365-366 female psychopathy and, 514 genetic factors and, 29-30, 30t importance of fathers and, 27 Levenson Self-Report Psychopathy Scale (LSRP) and, 223t "mask" concept and, 5-6 neuroanatomical features and, 382, 385-386 overview, 17, 285-287 psychopathy and, 299 Psychopathy Checklist-Revised (PCL-R) and, 49-50, 61, 62 subscale-level differences and, 270-271 successful psychopathy and, 585, 587, 594-595,600 treatment and, 711-713 twin studies and, 336

Criminality (cont.) variants of psychopathy and, 320, 324 See also Criminal justice system; Predatory criminality; Serial murder; Sexual coercion Cross-cultural research, 530, 558-559. See also Cultural factors Cruelty, 115, 303, 592 Cultural factors anecdotal evidence for, 531 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 206 construct validity, 541, 542t-549t, 550-559 family factors and, 373 incarcerated and psychiatric samples, 531-537, 533t overview, 529-531, 558-559 recidivism and, 691-693 variants of psychopathy and, 327 See also Ethnicity Cultural Formulation Interview (CFI), 530 Dahmer, Jeffrey, 577-580, 577t, 582. See also Serial murder Daringness, 485, 498. See also Boldness; Venturesomeness Data collection, 686-687 Deception and deceitfulness aggression and, 612-613 antisocial personality disorder (ASPD) and, 8, 22, 284 clinical interviews and, 196 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 202 criminality and, 286-287 detecting, 196 narcissistic personality disorder (NPD) and, 287-288 Psychopathy Checklist-Revised (PCL-R), 64-65 structural models of personality and, 261 youth psychopathy and disruptive behavior disorders, 481 See also Lying Decision making integrated emotion systems approach and, 411-412 neurological factors and, 414f reinforcement-based decision making, 410-413, 410f substance use disorders and, 638, 644-645, 649-650 successful psychopathy and, 594 trait-based approaches and, 303 Defensive processes boldness and, 169 core affect processing system and, 425 reactivity and, 431-436, 443, 592, 599 See also Fear; Fear reactivity; Threat reactivity Defensive techniques, 194

Deliberation criminality and, 286-287 five-factor model (FFM) and, 265t, 267t, 269, 274f subscale-level differences and, 273t Delinguency comorbidity between conduct disorder and attention-deficit/hyperactivity disorder and, 461, 462 female psychopathy and, 518 genetic factors and, 341 onset of conduct problems in childhood and adolescence and, 460 peer, school, and neighborhood factors, 368-369 Self-Report Psychopathy scale (SRP) and, 229t successful psychopathy and, 598 teenage parents and, 367 twin studies and, 336 youth psychopathy and disruptive behavior disorders, 485 See also Antisocial behavior; Antisocial factor (of psychopathy) Dependent personality disorder, 243t, 275 Depression dual-disposition model and, 14 externalizing proneness and, 129 five-factor model (FFM) and, 265t, 267t, 274f "madness" of psychopathy and, 7 "mask" concept and, 5-6 onset of conduct problems in childhood and adolescence and, 459 overview, 772n subscale-level differences and, 272t temperament dimensions and, 101 youth psychopathy and disruptive behavior disorders, 481 Destructiveness, 7, 8, 115, 303, 481 Detachment attachment and, 443 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 202 genetic factors and, 338 Levenson Self-Report Psychopathy Scale (LSRP) and, 223t Self-Report Psychopathy scale (SRP) and, 227t sexual coercion and, 672, 673 Triarchic Psychopathy Measure (TriPM) and, 235, 238t Developmental processes antisocial behavior and, 49-50 callous-unemotional traits and, 148-149, 463-469 cognitive and emotional processing and, 444-445 comorbidity between conduct disorder and attention-deficit/hyperactivity disorder and, 460–462 conduct disorder and, 465 female psychopathy and, 514-515 future directions, 467-469, 760-763 onset of conduct problems in childhood and adolescence, 459-460

overview, 456-457 pathways to psychopathy and, 110-115 serial murderers and, 573 substance use disorders and, 643-644 successful psychopathy and, 594-595 treatment and, 720 variants of psychopathy and, 425 See also Adolescence; Childhood DHEA (dehydroepiandrosterone), 152 Diagnosis antisocial personality disorder (ASPD) and, 22-23, 24-25, 24f, 25f, 52-53, 282-285 callous-unemotional traits and, 144 cognitive and emotional processing and, 446-447 conduct disorder and, 459, 465, 468-469, 482-483 criteria for, 4-6, 5t cultural variations in psychopathology and, 541, 550-551 externalizing psychopathology factor and, 128-129, 132-133, 134-135 family background and, 354 future directions, 755-759 integrative approach and, 768 "mask" concept and, 4-6, 5t overview, 94-95 psychopathic personality and, 22 role of psychopathy in the legal system and, 734 serial murderers and, 574-575 sexual coercion and, 663 structural models of personality and, 263-264 successful psychopathy and, 591-592 temperament dimensions and, 97 twin studies and, 336 youth psychopathy and disruptive behavior disorders, 480-486, 496, 498 Diagnostic and Statistical Manual of Mental Disorders (DSM-II), 128 Diagnostic and Statistical Manual of Mental Disorders (DSM-III) antisocial personality disorder (ASPD) and, 8, 52–53, 282–285, 638 assessment and, 756 correlation and, 217 criminality and, 285 externalizing psychopathology factor and, 128, 289 psychopathic personality and, 22 sexual coercion and, 663 undersocialized and socialized subgroups of antisocial youth, 462-463 Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R) antisocial personality disorder (ASPD) and, 52-53, 283-284, 638 assessment and, 756 criminality and, 285 externalizing psychopathology factor and, 128, 289

Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) antisocial personality disorder (ASPD) and, 8, 22-23, 40-41, 52-53, 282, 283-284 assessment and, 756-757, 759 attention-deficit/hyperactivity disorder (ADHD) and, 105, 110 criminality and, 285-287 externalizing disorders and, 289 internalizing disorders and, 291 Lykken's thesis and, 33 narcissistic personality disorder (NPD) and, 287-288 overview, 732 psychopathic personality and, 22 sadism and, 618-619 sexual coercion and, 663 substance use disorders and, 640 Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR), 53, 619, 663 Diagnostic and Statistical Manual of Mental Disorders (DSM-5) antisocial personality disorder (ASPD) and, 8, 23, 53-54, 282-285 assessment and, 756-757, 759-760 boldness and, 170, 172, 175 callous-unemotional traits and, 144, 468-469 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 199-200, 204 conduct disorder and, 111, 459, 465, 468-469, 763 criminality and, 285-287 cultural variations in psychopathology and, 530, 541, 550-551, 554 dual-disposition model and, 16 ethical standards and guidelines and, 743 externalizing spectrum model and, 133-134 five-factor model (FFM) and, 267t, 269, 276 integrative approach and, 768-769 internalizing disorders and, 290 overview, 94, 281, 755 personality pathology and, 18n, 22, 281-289 Psychopathy Checklist-Revised (PCL-R) and, 48 psychopathy in, 757-759 sadism and, 618-619 sexual coercion and, 663 structural models of personality and, 263-264 subscale-level differences and, 271, 272t-273t substance use disorders and, 637, 639-641 triarchic model and, 68n Triarchic Psychopathy Measure (TriPM) and, 238t twin studies and, 336 youth psychopathy and disruptive behavior disorders, 479, 480-486, 497, 498

Diffusion tensor imaging (DTI), 380, 386. See also Neuroimaging technologies Dimensional Assessment of Personality Pathology-Differential Questionnaire, 646 Dimensional model, 301-304, 304f, 422-423 Dimensionality, 9, 45-46 Disaffiliation, 443, 581 Disagreeable disinhibition, 95-96, 100 Disagreeableness, 201 Discipline, 244t, 358, 359, 363, 464, 552 Discriminant validity, 240. See also Validity Disengagement, 300, 594 Dishonesty, 115, 213, 360f-362t Disinhibition aggression and, 615 antisocial personality disorder (ASPD) and, 284 assessment and, 758, 759-760 boldness and, 179, 180 cognitive and emotional processing and, 444-445, 446 core affect processing system and, 42.6 dual-disposition model and, 12-13, 14, 15-16, 17 Elemental Psychopathy Assessment (EPA) and, 240 externalizing disorders in childhood and adolescence, 104-105 externalizing proneness and, 127, 131, 134, 134-135, 135, 138 externalizing spectrum model and, 129-134, 130f, 133f female psychopathy and, 522 five-factor model (FFM) and, 270 future directions, 521-522 integrative approach and, 769-770 internalizing disorders and, 291 "madness" of psychopathy and, 7 overview, 10, 17, 289, 429-431 pathways to psychopathy and, 110-111, 114-115 Psychopathy Checklist-Revised (PCL-R), 63 response modulation hypothesis (RMH) and, 81-82, 82f Self-Report Psychopathy scale (SRP) and, 227t serial murderers and, 573 sexual coercion and, 664 subscale-level differences and, 272t-273t substance use disorders and, 636-637, 638, 641, 644, 649-650 successful psychopathy and, 590, 592, 594, 598 temperament dimensions and, 96, 99-100, 102-104 trait-based approaches and, 303-304, 304f treatment and, 717 Triarchic Psychopathy Measure (TriPM) and, 235, 238t, 247 unitary mechanism model and, 10-11

variants of psychopathy and, 297–298, 309, 321, 323t, 324-325, 327 See also Externalizing disorders; Externalizing proneness; Externalizing psychopathology factor; Trait disinhibition Disorganization, 105, 107, 153 Dispositional fear, 12, 769 Dispositional risk factors, 459-460. See also Risk factors Dispositional tendencies, 10 Disrupted families, 364-365. See also Family factors Disruptive behavior disorders, 480-486. See also Attentiondeficit/hyperactivity disorder (ADHD); Conduct disorder (CD); Oppositional defiant disorder (ODD)Disruptiveness, 202 Dissocial personality disorder, 734 Dissociative mechanisms, 300 Distress cues, 437-439, 621, 664 Distrust, 597 Divorce, 364-365. See also Family factors Domestic violence. See Intimate partner violence Dominance Comprehensive Assessment of Psychopathic Personality (CAPP) and, 202, 203f Elemental Psychopathy Assessment (EPA) and, 240, 245 female psychopathy and, 513 internalizing disorders and, 291 narcissistic personality disorder (NPD) and, 288-289 recidivism and, 698 subscale-level differences and, 272t-273t successful psychopathy and, 589 Triarchic Psychopathy Measure (TriPM) and, 236t Dopamine system attention-deficit/hyperactivity disorder (ADHD) and, 108-109 brain deficits and impairments, 393 core affect processing system and, 425-426 high-level cognitive mechanisms and, 427, 428 molecular genetic studies, 341-342 neuroanatomical features and, 384 pathways to psychopathy and, 112 sexual coercion and, 671, 672 substance use disorders and, 647 temperament dimensions and, 97 Dorsolateral prefrontal cortex, 427, 435 Dorsomedial prefrontal cortex integrated emotion systems approach and, 406, 407f, 410-411, 413-414, 413f paralimbic hypothesis, 402 Drug abuse and dependence antisocial personality disorder (ASPD) and, 283-284 externalizing proneness and, 129 genetic factors and, 341-342

Drug abuse and dependence (cont.) Levenson Self-Report Psychopathy Scale (LSRP) and, 223t Self-Report Psychopathy scale (SRP) and, 228t successful psychopathy and, 593 temperament dimensions and, 101 youth psychopathy and disruptive behavior disorders, 494 See also Substance use disorders (SUDs) DSM-5 Psychopathy Specifier, 172 Dual diagnosis, 640-641. See also Comorbidity Dual pathway theory, 592 Dual process models, 178, 591, 644 Dual-disposition model, 10, 12-17 Dutifulness five-factor model (FFM) and, 264, 265t, 267t, 269, 274f subscale-level differences and, 273t Effortful control, 95, 98-100, 106, 485 Egocentricity criminality and, 286-287 female psychopathy and, 515 genetic factors and, 338 sexual coercion and, 669, 671 successful psychopathy and, 585 youth psychopathy and disruptive behavior disorders, 483-484 Elemental Psychopathy Assessment (EPA) boldness and, 172, 178 five-factor model (FFM) and, 267t, 269-270, 276 internalizing disorders and, 291 overview, 220, 239-245, 241t-244t subscale-level differences and, 271, 272t-273t See also Self-report instruments Emergent traits, 34-36, 35f, 178. See also Genetic factors Emotion recognition training (ERT), 723t Emotional abuse, 612. See also Abuse Emotional cues, 405, 644-645 Emotional empathy, 404-406, 404f Emotional functioning coldness, 484-485 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 202, 203f, 204 Elemental Psychopathy Assessment (EPA) and, 243t emotion regulation, 112-113, 116-117, 458 high-level cognitive mechanisms and, 428-429 reactivity and, 12, 492 recidivism and, 698 responsiveness, 10-11, 465, 466 self-report measures and, 214 sensitivity and, 11, 116 stability of, 202, 204, 240, 270 youth psychopathy and disruptive behavior disorders, 492-494 Emotional intelligence, 223t

Emotional processing callous-unemotional traits and, 151, 155 female psychopathy and, 519-520, 522 overview, 422, 425-429 response modulation hypothesis (RMH) and, 89 sexual coercion and, 664 See also Affective processing Empathic sensitivity, 436-444, 447n Empathy aggression and, 612, 622 callous-unemotional traits and, 150-151, 154-155 clinical interviews and, 191 comorbidity between conduct disorder and attention-deficit/hyperactivity disorder and, 461-462 cultural variations in psychopathology and, 551 externalizing spectrum model and, 132 family factors and, 373 integrated emotion systems approach and, 403-407, 404f, 407f integrative approach and, 771 narcissistic personality disorder (NPD) and, 287-288, 288 neurological factors and, 414-415, 414f noncriminal psychopathy and, 30-31 pain processing and, 440 psychopathy and, 111, 114, 115, 298, 597 response modulation hypothesis (RMH) and, 85 Self-Report Psychopathy scale (SRP) and, 225, 228t, 229t serial murderers and, 573 sexual coercion and, 673 social attachment and, 442-443 socialization and, 26 temperament dimensions and, 101, 116 treatment and, 724 Triarchic Psychopathy Measure (TriPM) and, 239t youth psychopathy and disruptive behavior disorders, 484-485 Employment, 588-589, 596 Environmental factors attention bottleneck and, 86-87, 87f behavior genetic studies of psychopathic traits, 338-340 biosocial perspective, 389 callous-unemotional traits and, 148-149, 150, 154, 156 child abuse and neglect and, 364 criminality and, 27, 28-29, 29f externalizing proneness and, 137 future directions, 346-347 Lykken's thesis and, 33-34 methodological issues and, 369-370 neurological factors and, 389, 394 overview, 335, 346-347, 415 peer, school, and neighborhood factors, 368-369 psychopathic personality and, 36 psychopathy and, 299, 300, 324, 588 social attachment and, 442 temperament dimensions and, 95

trait-based approaches and, 302 youth psychopathy and disruptive behavior disorders, 485 See also Twin studies Epidemiological Catchment Area study, 23, 31n, 638 Epilepsy, 382, 384 Episodic memory, 403. See also Memory processes Erratic lifestyle Elemental Psychopathy Assessment (EPA) and, 241t five-factor model (FFM) and, 274, 276 sexual coercion and, 669, 670 subscale-level differences and, 270-271 Error-related negativity (ERN) response, 103, 131, 136-137, 645-646 Ethical issues, 732-733, 735-746, 766 Ethnicity construct validity, 555-558 methodological issues and, 369-370 overview, 530, 535-536, 558-559 Psychopathy Checklist-Revised (PCL-R) and, 62, 62f, 537 recidivism and, 691-693 variants of psychopathy and, 327 See also Cultural factors European IMAGEN project, 765, 771-772 Event-related potential (ERP) disinhibition and, 430 distress cues and, 439 externalizing proneness and, 136-137 response modulation hypothesis (RMH) and, 84-85 substance use disorders and, 645-646 temperament dimensions and, 103 Evidence, 734-735 Evolutionary processes, 26, 69n, 664 Excitement seeking boldness and, 170 five-factor model (FFM) and, 265t, 267t, 269, 274f narcissistic personality disorder (NPD) and, 288-289 pathways to psychopathy and, 115 personality disorders and, 275 subscale-level differences and, 272t Executive control system inattention-disorganization and, 107 pathways to psychopathy and, 110-111 temperament dimensions and, 94, 98-100, 115-116, 117 Executive functions (EF) attention-deficit/hyperactivity disorder (ADHD) and, 105, 106 boldness and, 166 externalizing proneness and, 136, 138 integrated emotion systems approach and, 413-414 pathways to psychopathy and, 110, 113 substance use disorders and, 644-645 successful psychopathy and, 388, 592, 595, 597 temperament dimensions and, 98-100 Expectancies, 81, 82f, 412-413 Expert ratings, 264, 265t, 266

terminology, 353

Expertise Centre for Forensic Psychiatry (EFP), 55-56 Exploitativeness externalizing psychopathology factor and, 131, 131-132 narcissistic personality disorder (NPD) and, 287-288 overview, 17 psychopathy and, 115, 590 structural models of personality and, 261 Triarchic Psychopathy Measure (TriPM) and, 235 Exploratory factor analysis (EFA) boldness and, 167 cultural variations in psychopathology and, 537, 559 genetic factors and, 339 subscale-level differences and, 271 Exploratory regression analysis, 384 Externalizing disorders in childhood and adolescence, 104-110 female psychopathy and, 515-516 overview, 289-290 Psychopathy Checklist-Revised (PCL-R), 62 temperament dimensions and, 116-117 See also Externalizing proneness; Externalizing psychopathology factor Externalizing psychopathology factor behavior and, 12-13 boldness and, 179 callous-unemotional traits and, 154-155 disinhibition and, 102-103 female psychopathy and, 522 integrated emotion systems approach and, 411 "madness" of psychopathy and, 7-8 neurological factors and, 414f overview, 10, 128 Psychopathy Checklist-Revised (PCL-R), 61 substance use disorders and, 646-647 successful psychopathy and, 594, 597 temperament dimensions and, 102 variants of psychopathy and, 321 See also Externalizing disorders; Externalizing proneness Externalizing proneness assessment and, 758 cognitive and emotional processing and, 444 correlates of, 134-138 externalizing spectrum model and, 129–134, 130f, 133f historic foundations of, 128-129 "madness" of psychopathy and, 13 overview, 127-128, 138-139, 139f, 429-431 substance use disorders and, 645, 649-650 trait-based approaches and, 303 See also Disinhibition; Externalizing disorders; Externalizing psychopathology factor

Externalizing Spectrum Inventory (ESI) overview, 14, 130-131, 130f substance use disorders and, 637-638, 642, 643, 650 temperament dimensions and, 102 Triarchic Psychopathy Measure (TriPM) and, 235 Externalizing Spectrum Inventory-Brief Form (ESI-BF), 131, 132 Externalizing spectrum model, 129-134, 130f, 133f Extraversion boldness and, 174 cultural variations in psychopathology and, 551 Elemental Psychopathy Assessment (EPA) and, 240, 243t five-factor model (FFM) and, 264, 266, 269 narcissistic personality disorder (NPD) and, 288-289 personality disorders and, 275 Psychopathic Personality Inventory (PPI) and, 233t Self-Report Psychopathy scale (SRP) and, 225, 227t structural models of personality and, 260, 261, 263 temperament dimensions and, 94, 95-96, 100 Triarchic Psychopathy Measure (TriPM) and, 238t variants of psychopathy and, 309, 321, 323t, 326 Eysenck Personality Questionnaire (EPQ), 551-552, 556 Eysenck's Extraversion scale, 217, 218-219, 260-264 Eysenck's PEN model, 260 Facial-affect recognition. See Fear face recognition Factor 1 features. See Psychopathy Factor 1 Factor 2 features. See Psychopathy Factor 2 Factor analysis cultural variations in psychopathology and, 536-537, 559 externalizing psychopathology factor and, 128, 133 female psychopathy and, 511-512 internalizing disorders and, 291 subscale-level differences and, 271 temperament dimensions and, 95-96, 97 youth psychopathy and disruptive behavior disorders, 483 See also Exploratory factor analysis (EFA); Structural equation modeling (SEM) Factor structures, 42-43, 43t, 44f, 536-537, 559 Family Check-Up (FCU), 723t Family factors callous-unemotional traits and, 148-149, 153-154 child abuse and neglect, 363-364

childrearing problems, 357-363, 360t, 361t, 362t criminality and, 28-29, 29f, 365-366 developmental pathways to conduct problems and, 466-467 family-based prevention, 370-372 female psychopathy and, 517, 519 future directions, 372-373 gender differences and, 612 importance of fathers and, 27 large family size, 365 methodological issues and, 369-370 onset of conduct problems in childhood and adolescence and, 459 overview, 354-356, 357-358, 372-373 parental conflict and disrupted families, 364-365 parental features, 366-367 peer, school, and neighborhood factors, 368-369 psychopathy and, 112-113, 299, 585, 600 risk factors and, 369 social attachment and, 442 socialization and, 26-27 socioeconomic status and, 367-368 sociopaths and, 23 Fantasy five-factor model (FFM) and, 265t, 267t, 274f serial murderers and, 582 sexual coercion and, 668-669, 670-671, 673 subscale-level differences and, 272t Fathers, 27, 36-37, 364-365, 366-367. See also Family factors Fear affect startle modulation studies and, 433, 436 attention-deficit/hyperactivity disorder (ADHD) and, 106 boldness and, 168, 169, 170 callous-unemotional traits and, 152 - 153conditioning and, 80, 276, 300, 382 core affect processing system and, 425 criminality and, 28 developmental pathways to conduct problems and, 465, 466 expression of, 405-406 externalizing proneness and, 135 integrated emotion systems approach and, 405-406 internalizing disorders and, 290-291 overview, 7 pain processing and, 440 Self-Report Psychopathy scale (SRP) and, 229t structural models of personality and, 260 temperament dimensions and, 94, 96-97, 98, 99-100, 101, 104, 115-116 Triarchic Psychopathy Measure (TriPM) and, 235 unitary mechanism model and, 12 See also Fear reactivity; Fearless Dominance (FD) factor; Fearlessness; Threat reactivity

Fear face recognition cultural variations in psychopathology and, 553-554, 555 developmental pathways to conduct problems and, 466 distress cues and, 437-439 youth psychopathy and disruptive behavior disorders, 493-494 Fear-potentiated startle (FPS), 432, 520 Fear reactivity cultural variations in psychopathology and, 555 overview, 432 response modulation hypothesis (RMH) and, 84-85 successful psychopathy and, 592, 597 unitary mechanism model and, 11, 12 See also Fear; Threat reactivity Fearless Dominance (FD) factor affect startle modulation studies and, 433, 434-435 aggression and, 615-616 boldness and, 168, 171, 173-175, 177, 178 cognitive and emotional processing and, 447n factorial coherence of, 174-175 female psychopathy and, 517 five-factor model (FFM) and, 276 internalizing disorders and, 291 narcissistic personality disorder (NPD) and, 287 overview, 9, 423-424, 429, 431-436 Psychopathic Personality Inventory (PPI) and, 231 Psychopathy Checklist-Revised (PCL-R) and, 63 recidivism and, 685, 697 sexual risk taking and, 176–177 social attachment and, 443 subscale-level differences and, 270-271 successful psychopathy and, 589, 597, 598, 599 temperament dimensions and, 101 trait-based approaches and, 302, 303 variants of psychopathy and, 307-309, 308f See also Boldness; Fearlessness Fearlessness affect startle modulation studies and, 433 boldness and, 167 callous-unemotional traits and, 152 - 153cognitive and emotional processing and, 446 criminality and, 28 dual-disposition model and, 13 Elemental Psychopathy Assessment (EPA) and, 242t, 245 genetic factors and, 338 integrative approach and, 769-770 internalizing disorders and, 290, 290-291 noncriminal psychopathy and, 30 overview, 165 psychopathy and, 111, 114, 115, 300

Psychopathy Checklist-Revised (PCL-R) and, 50-52, 51, 62 Self-Report Psychopathy scale (SRP) and, 225 serial murderers and, 573 successful psychopathy and, 591, 592, 597-598, 599 temperament dimensions and, 94, 100-101, 116-117 Triarchic Psychopathy Measure (TriPM) and, 235, 236t unitary mechanism model and, 11-12 youth psychopathy and disruptive behavior disorders, 491 See also Boldness; Fearless Dominance (FD) factor Feedback-related negativity (FRN), 137, 520 Feelings, 265t, 267t, 272t, 274f Female psychopathy assessment and, 510-512 correlates of psychopathy in females and, 512-517 female psychopathy and, 522 future directions, 521-522 manifestations of psychopathy in women, 517–518 overview, 509-510, 519-522 putative mechanisms, 518-519 serial murderers and, 572 See also Gender differences Fight-flight response, 98, 99-100 Fight-flight-fear system, 98 Five-factor model (FFM) antisocial personality disorder (ASPD) and, 54 assessment and, 268-270, 757 boldness and, 172-173, 177 cultural variations in psychopathology and, 552 dual-disposition model and, 13, 16 Elemental Psychopathy Assessment (EPA) and, 239-240 externalizing psychopathology factor and, 132, 135-136 internalizing disorders and, 290 narcissistic personality disorder (NPD) and, 288 overview, 260, 275-276, 424 psychopathy and, 112-113, 264-268, 265t, 267t, 268, 268f, 307, 593 Psychopathy Checklist—Revised (PCL-R) and, 69n Self-Report Psychopathy scale (SRP) and, 225 structural models of personality and, 261-264 subscale-level differences and, 270-271, 272t-273t temperament dimensions and, 95–96 See also Personality Four-factor model aggression and, 615 cultural variations in psychopathology and, 537 Psychopathy Checklist-Revised (PCL-R), 42-43, 43t, 44f, 58-64, 60f, 62f, 63

recidivism and, 692 temperament dimensions and, 95-96 Functional imaging technology, 381, 382. See also Neuroimaging technologies Functional magnetic resonance imaging (fMRI) affect-processing systems and, 438 amygdala reactivity and, 438-439 callous-unemotional traits and, 151 different forms of psychopathy and, 387 disinhibition and, 430 environmental factors and, 389 externalizing proneness and, 137-138 integrated emotion systems approach and, 405, 406-407 neuroanatomical features and, 381, 383, 384, 385 overview, 380, 763-764, 765 pain processing and, 439-440 paralimbic hypothesis, 402, 403 See also Neuroimaging technologies Gambling, 229t, 244t, 289 Gender differences aggression and, 457-458, 612, 620-621 assessment and, 197-198, 510-512, 741 child abuse and neglect and, 364 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 205-206 externalizing proneness and, 128 family factors and, 358, 360f-362t, 366 five-factor model (FFM) and, 264, 275 genetic factors and, 339, 340, 341 manifestations of psychopathy in women, 517-518 methodological issues and, 369-370 onset of conduct problems in childhood and adolescence and, 460 Psychopathy Checklist-Revised (PCL-R), 62, 62f recidivism and, 690-691, 700 serial murderers and, 572 sexual coercion and, 670 variants of psychopathy and, 327 See also Female psychopathy Genetic factors antisocial behavior and, 49-50 behavior genetic studies of psychopathic traits, 338-340 brain deficits and impairments, 393 callous-unemotional traits and, 149-150, 153, 154, 155-156 cognitive and emotional processing and, 444-445 criminality and, 27, 29-30, 30t dual-disposition model and, 16-17 endophenotypes for antisocial behavior, 345-346 externalizing psychopathology factor and, 127-128, 129, 129-130, 289-290 future directions, 346-347 integrative approach and, 767 Lykken's thesis and, 34

callous-unemotional traits and, 150-151

Guilt and guiltlessness

"madness" of psychopathy and, 7 molecular genetic studies, 340-344 neurological factors and, 394 noncriminal psychopathy and, 30 overview, 18n, 335, 346-347, 415 personality traits and, 325 psychopathic personality and, 34-36, 35f psychopaths and, 23 psychopathy and, 299, 591, 597 sociopaths and, 23 substance use disorders and, 635, 642, 646-648,650 temperament dimensions and, 95 terminology, 353 youth psychopathy and disruptive behavior disorders, 485 Genomewide association studies (GWAS) callous-unemotional traits and, 150 cognitive and emotional processing and, 446 endophenotypes for antisocial behavior and, 346 overview, 343-344, 347 psychopathic personality and, 35-36 See also Genetic factors Genomewide complex trait analysis (GCTA), 35-36, 344 Global functioning, 105-106 Goal-directed behavior callous-unemotional traits and, 150-151 Psychopathy Checklist-Revised (PCL-R) and, 51 response modulation hypothesis (RMH) and, 80-81, 81-82, 82f sexual coercion and, 671 successful psychopathy and, 588-589 Go/no-go passive avoidance tasks, 83-84, 223t Grandiosity cultural variations in psychopathology and, 540 genetic factors and, 338-339 narcissistic personality disorder (NPD) and, 287-288 Self-Report Psychopathy scale (SRP) and, 227t subscale-level differences and, 270-271 Triarchic Psychopathy Measure (TriPM) and, 237t, 238t youth psychopathy and disruptive behavior disorders, 498 Gratification delay, 40, 99 Gray-matter volume brain deficits and impairments, 392 core affect processing system and, 425 different forms of psychopathy and, 388 neuroanatomical features and, 382, 384 pain processing and, 440 Psychopathy Checklist-Revised (PCL-R), 61-62 successful psychopathy and, 596 Gregariousness, 265t, 267t, 272t, 274f, 589

comorbidity between conduct disorder and attention-deficit/hyperactivity disorder and, 461 criminality and, 28 cultural variations in psychopathology and, 551 developmental pathways to conduct problems and, 465, 466-467 dual-disposition model and, 13 Levenson Self-Report Psychopathy Scale (LSRP) and, 223t narcissistic personality disorder (NPD) and, 288 psychopathy and, 40, 111, 115, 298, 585 self-report measures and, 250 serial murderers and, 573 treatment and, 724 Triarchic Psychopathy Measure (TriPM) and, 247 Hare Self-Report Psychopathy Scale (SRP, SRP-II, SRP-III, SRP-4). See Self-Report Psychopathy scale (SRP, SRP-II, SRP-III, SRP-4) Harm avoidance Levenson Self-Report Psychopathy Scale (LSRP) and, 223t Self-Report Psychopathy scale (SRP) and, 228t structural models of personality and, 260, 261, 262, 262t Triarchic Psychopathy Measure (TriPM) and, 239t Head injury. See Brain injury/damage Heritability, 36-37, 130, 299, 519. See also Genetic factors Heroism, 239t, 589 Heterogeneity callous-unemotional traits and, 155 - 156cultural variations in psychopathology and, 551 serial murderers and, 572 trait-based approaches and, 302 variants of psychopathy and, 304 Hierarchical-dimensional conceptualization, 129-134, 130f, 133f High-level cognition mechanisms, 98, 99, 426-428 Hippocampus boldness and, 170 brain deficits and impairments, 394 causes of psychopathic behavior and, 391-392 high-level cognitive mechanisms and, 428 overview, 383-385 paralimbic hypothesis, 403 successful psychopathy and, 596 Historical, Clinical, Risk Management-20 (HCR-20) assessments in legal contexts and, 740-741 Psychopathy Checklist-Revised (PCL-R), 56, 58, 67 recidivism and, 683, 684, 695, 698

516, 517 Homicides, 616-617, 619-620, 626-627. See also Serial murder Honesty, 28, 227t, 243t, 303 Hormonal factors boldness and, 168 callous-unemotional traits and, 152, 154, 155-156 female psychopathy and, 518-519 molecular genetic studies, 341-342 Hostility antisocial personality disorder (ASPD) and, 284 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 201 five-factor model (FFM) and, 265t, 267t, 274f high-level cognitive mechanisms and, 427 Levenson Self-Report Psychopathy Scale (LSRP) and, 223t psychopathy and, 115, 597 Self-Report Psychopathy scale (SRP) and, 228t sexual coercion and, 671 subscale-level differences and, 271, 272t temperament dimensions and, 96 Triarchic Psychopathy Measure (TriPM) and, 239t Hot systems, 98-99, 300 Humility, 227t, 243t Hypersexuality, 670-673, 674-675 Hypothalamic-pituitary-adrenal (HPA) axis, 152, 386 Hypothalamus, 409, 409f, 425, 672 Ideas, 265t, 267t, 273t, 274f Implicit Association Test (IAT), 621 Impulsive Antisociality factor, 9, 101-102, 287, 589 Impulsive-antisocial factor (of psychopathy) dual-disposition model and, 15 externalizing proneness and, 131 "madness" of psychopathy and, 7 overview, 9, 10 psychopathy in adults and, 100 unitary mechanism model and, 11 - 12Impulsivity and impulse control aggression and, 614, 621, 624 antisocial personality disorder (ASPD) and, 8, 22, 23, 284 attention-deficit/hyperactivity disorder (ADHD) and, 108 boldness and, 167 cognitive and emotional processing and, 445 comorbidity between conduct disorder and attention-deficit/hyperactivity disorder and, 461 Comprehensive Assessment of Psychopathic Personality (CAPP) and. 204 criminality and, 28

Histrionic personality disorder, 242t,

Impulsivity and impulse control (cont.) cultural variations in psychopathology and, 539-540, 540, 551-552, 555-556 developmental pathways to conduct problems and, 463 dual-disposition model and, 12-13 externalizing psychopathology factor and, 127, 129-130, 132, 134-135 family factors and, 360f-362t, 373 female psychopathy and, 517, 518, 522 five-factor model (FFM) and, 265t, 267t, 274f, 276 future directions, 521-522 genetic factors and, 338-339 high-level cognitive mechanisms and, 427 integrated emotion systems approach and, 411–412 Levenson Self-Report Psychopathy Scale (LSRP) and, 223t "madness" of psychopathy and, 7 neuroanatomical features and, 383-384, 386-387, 388 neurological factors and, 414f nonconforminaty and, 167, 168, 338 pain processing and, 440 personality disorders and, 275 psychopathy and, 36, 40, 111-112, 300, 309, 323t, 326, 327-328, 588, 589, 592, 597-598 Psychopathy Checklist-Revised (PCL-R), 63, 68n recidivism and, 689 reward sensitivity and, 411-412 Self-Report Psychopathy scale (SRP) and, 227t serial murderers and, 573, 577t, 579, 580 sexual coercion and, 662, 664, 670, 671, 674, 675 subscale-level differences and, 270-271, 272t substance use disorders and, 639, 641, 642, 643, 645-646 temperament dimensions and, 96, 101, 103, 117-118, 118 trait-based approaches and, 302, 303 Triarchic Psychopathy Measure (TriPM) and, 235, 236t, 237t, 238t, 239t youth psychopathy and disruptive behavior disorders, 485, 490, 493, 498 Inattention, 105, 107 Incremental validity, 694-696, 701. See also Validity Individual differences, 149, 168, 327, 772n Informant ratings, 207, 241t, 243t, 248-249, 761-762. See also Parent ratings; Teacher ratings Information processing, 83-87, 87f, 89-90 Inhibition, 103, 114, 413-414, 612 Inhibitory control attention-deficit/hyperactivity disorder (ADHD) and, 106 biobehavioral trait approach and, 17

# Subject Index

cognitive and emotional processing

and, 444 externalizing proneness and, 134, 136 overview, 429-431 substance use disorders and, 636-637, 644, 645-646 See also Response control systems Insight, lack of, 40, 213-214, 249 Institutional settings, 689-690, 692 Instrumental aggression callous-unemotional traits and, 150 - 151overview, 458-459, 613-617, 621, 626-627 Psychopathy Checklist-Revised (PCL-R), 62 youth psychopathy and disruptive behavior disorders, 625 See also Aggression Integrative approaches, 403-414, 404f, 407f, 408f, 409f, 410f, 413f, 766-772 Intellectual disability, 689 Intelligence aggression and, 624 boldness and, 166, 169-170 cognitive and emotional processing and, 492 comorbidity between conduct disorder and attention-deficit/hyperactivity disorder and, 461 family factors and, 358 methodological issues and, 369-370 overview, 369 paralimbic hypothesis, 402 Psychopathy Checklist-Revised (PCL-R) and, 48 recidivism and, 689, 696 structural models of personality and, 263 successful psychopathy and, 595, 600 See also IQ Internalizing disorders boldness and, 176 externalizing disorders in childhood and adolescence, 105 female psychopathy and, 516-517 overview, 289, 290-291 See also Internalizing psychopathology factor Internalizing psychopathology factor dual-disposition model and, 14 externalizing spectrum model and, 129 "madness" of psychopathy and, 7-8 overview, 128 temperament dimensions and, 116 trait-based approaches and, 302 See also Internalizing disorders International Classification of Diseases (ICD-10), 619 International Classification of Diseases (ICD-11), 263-264, 498 Interpersonal callousness (IC), 156n, 490. See also Antagonism; Callousunemotional (CU) traits; Meanness Interpersonal factor (of psychopathy) aggression and, 621, 622 assessment and, 736-737 boldness and, 165, 173-174, 181

child abuse and neglect and, 363 comorbidity between conduct disorder and attention-deficit/hyperactivity disorder and, 461-462 cultural variations in psychopathology and, 540 detachment and, 235 Elemental Psychopathy Assessment (EPA) and, 241t gender differences and, 612 integrative approach and, 771 overview, 431 pain processing and, 440 peer, school, and neighborhood factors, 368 psychopathy and, 300, 322t, 326, 327-328, 585, 595, 597 Psychopathy Checklist-Revised (PCL-R), 43, 43t, 44f, 60f, 62, 62f, 63, 64-67, 65f, 66f, 67f recidivism and, 700 self-report measures and, 250 serial murderers and, 573-574, 577t, 578 - 579sexual coercion and, 664, 667, 669, 670, 673 substance use disorders and, 639, 646 trait-based approaches and, 302 Triarchic Psychopathy Measure (TriPM) and, 247 youth psychopathy and disruptive behavior disorders, 483-484, 490, 491 Interpersonal-affective factor (of psychopathy), 9 Interrater reliability, 212, 737-738. See also Reliability Interventions, 370-372, 393-394 Interview-based assessment, 15, 637. See also Clinical interviews Intimate partner violence female psychopathy and, 514, 522 onset of conduct problems in childhood and adolescence and, 459 psychopathy and, 299 Psychopathy Checklist-Revised (PCL-R), 62 recidivism and, 688-689 See also Violence Inventory of Callous-Unemotional Traits (ICU) callous-unemotional traits and, 147 cultural variations in psychopathology and, 538, 539, 540-541, 546t-549t, 552 future directions, 763 integrative approach and, 768-769 overview, 145-146, 155 trait-based approaches and, 303 treatment and, 722t Triarchic Psychopathy Measure (TriPM) and, 237t youth psychopathy and disruptive behavior disorders, 482 See also Meanness Iowa Gambling Task, 593-594, 645 IQ aggression and, 624 boldness and, 169 callous-unemotional traits and, 154

female psychopathy and, 510, 513

cognitive and emotional processing and, 492 cultural variations in psychopathology and, 556 importance of fathers and, 27 methodological issues and, 369-370 overview, 369 paralimbic hypothesis, 402 pathways to psychopathy and, 111, 113 serial murderers and, 572 See also Intelligence Irresponsibility aggression and, 614 antisocial personality disorder (ASPD) and, 8, 22, 23, 284 child abuse and neglect and, 363 cultural variations in psychopathology and, 540 female psychopathy and, 518 genetic factors and, 338-339 narcissistic personality disorder (NPD) and, 288-289 peer, school, and neighborhood factors, 368 Psychopathy Checklist-Revised (PCL-R), 63 serial murderers and, 579 subscale-level differences and, 270-271 successful psychopathy and, 597 trait-based approaches and, 303 Triarchic Psychopathy Measure (TriPM) and, 237t youth psychopathy and disruptive behavior disorders, 485 Irritability, 13, 113, 481, 718 Item response theory (IRT), 482, 691 Karolinska Scales of Personality (KSP), 551-552 Labeling, 45, 744-746 Language factors, 206, 622, 734, 744-746 Latent class analysis (LCA), 59, 64, 67-68,306 Latent profile analysis (LPA) four-factor model of psychopathy and, 58 Psychopathy Checklist-Revised (PCL-R) and, 39, 64-67, 65f, 66f, 67-68, 67f variants of psychopathy and, 306 Leadership attributes, 596, 598 Learning, 169-170, 176, 382 Legal factors assessment and, 735-746 communicating about psychopathy, 744-746 overview, 732-733, 746 role of psychopathy in the legal system, 733-735 substance use disorders and, 640-641 Level of Service Inventory-Revised (LSI-R), 683, 698-699 Levenson Self-Report Psychopathy Scale (LSRP) boldness and, 171-172, 179 Elemental Psychopathy Assessment (EPA) and, 240, 241t, 245

five-factor model (FFM) and, 266, 267t, 269 overview, 220–224, 222t–223t, 247–250 subscale-level differences and, 270-271, 272t-273t triarchic model and, 246-247 Triarchic Psychopathy Measure (TriPM) and, 237t See also Self-report instruments Lifestyle factor (of psychopathy) aggression and, 615 comorbidity between conduct disorder and attention-deficit/hyperactivity disorder and, 461-462 Psychopathy Checklist-Revised (PCL-R), 43, 43t, 44f, 60f, 62, 62f, 64-67, 65f, 66f, 67f Limited prosocial emotions (LPE) specifier in DSM-5 assessments in legal contexts and, 742 child psychopathy and, 480, 481-482, 490, 497, 498 cultural variations in psychopathology and, 551, 554 ethical standards and guidelines and, 743 integrative approach and, 769 overview, 757, 763 Linguistic Inquiry and Word Count (LIWC), 622 Long-term offenders (LTOs), 57-58. See also Criminal offenders Love, inability to, 14, 40, 513 Lying "madness" of psychopathy and, 7 neuroanatomical features and, 387 psychopathy and, 40 self-report measures and, 213 sexual coercion and, 664, 672 youth psychopathy and disruptive behavior disorders, 483-484 See also Deception and Deceitfulness Lykken's thesis boldness and, 169, 173-174 overview, 33-37, 35f, 37, 94 psychopathy and, 591 MacArthur Violence Risk Assessment project, 692 Machiavellianism aggression and, 620 boldness and, 167, 168 Elemental Psychopathy Assessment (EPA) and, 243t externalizing spectrum model and, 132 five-factor model (FFM) and, 266 genetic factors and, 338 Levenson Self-Report Psychopathy Scale (LSRP) and, 223t Psychopathic Personality Inventory (PPI) and, 231 Self-Report Psychopathy scale (SRP) and, 227t sexual coercion and, 668, 670-671 Triarchic Psychopathy Measure (TriPM) and, 238t

Magnetic resonance imaging (MRI), 763-764 Magnetic resonance spectroscopy (MRS), 380, 381. See also Neuroimaging technologies Maltreatment, child. See Child maltreatment Manipulation/manipulativeness antisocial personality disorder (ASPD) and, 284 assessment and, 758 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 201, 202 criminality and, 286-287 cultural variations in psychopathology and, 540 female psychopathy and, 517 five-factor model (FFM) and, 274 genetic factors and, 338-339 narcissistic personality disorder (NPD) and, 287-288 neuroanatomical features and, 387 overview, 64 Psychopathy Checklist-Revised (PCL-R), 64-65, 65f sexual coercion and, 662, 664, 669, 670-673, 673, 674 subscale-level differences and, 270-271 Triarchic Psychopathy Measure (TriPM) and, 237t, 247 youth psychopathy and disruptive behavior disorders, 483-484, 498 See also Conning Manson, Charles, 582n "Mask" concept. See Cleckley's concept of psychopathy Mass murder, 571-572 Massachusetts Treatment Center's rapist typology (MTC:R), 666, 673, 674 Maternal factors, 36-37, 364, 367. See also Family factors Meanness aggression and, 615 assessment and, 758 attention-deficit/hyperactivity disorder (ADHD) and, 106-107 biobehavioral trait approach and, 17 boldness and, 180 cognitive and emotional processing and, 446 cross-domain assessment initiatives, 759-760 dual-disposition model and, 15-16, 17 externalizing spectrum model and, 132, 133f five-factor model (FFM) and, 276 internalizing disorders and, 291 overview, 17, 436-444 pain processing and, 447n-448n pathways to psychopathy and, 114-115 serial murderers and, 581 social attachment and, 442 successful psychopathy and, 592, 598 temperament dimensions and, 94-95, 100-101, 103-104, 117 trait-based approaches and, 303, 304f

Meanness (cont.) Triarchic Psychopathy Measure (TriPM) and, 235 See also Antagonism; Callous aggression; Callous-unemotional (CU) traits; Callousness Mechanisms, 86-87, 87f, 447n Memory processes brain deficits and impairments, 390 comorbidity between conduct disorder and attention-deficit/hyperactivity disorder and, 461 neuroanatomical features and, 385-386 paralimbic hypothesis, 403 response modulation hypothesis (RMH) and, 86-87 substance use disorders and, 644 Mental illness aggression and, 626 cultural variations in psychopathology and, 534, 541 female psychopathy and, 515-517 genetic factors and, 347 mass murderers and, 571-572 onset of conduct problems in childhood and adolescence and, 459 overview, 772n role of psychopathy in the legal system and, 734 socialization and, 26 structural models of personality and, 263-264 successful psychopathy and, 588 variants of psychopathy and, 324 Mesolimbic dopamine system, 97, 671, 672. See also Dopamine system Meta-analysis five-factor model (FFM) and, 266-268, 2.67t recidivism and, 683-684, 685, 693 treatment and, 711 twin studies and, 336-337, 337t Millon Adolescent Clinical Inventory (MACI), 157n Millon Clinical Multiaxial Inventory (MCMI), 718 Millon Clinical Multiaxial Inventory-II (MCMI-II), 219, 619 Minnesota Center for Twin and Family Research (MCTFR), 33, 35, 35f, 37 Minnesota Multiphasic Personality Inventory (MMPI), 217 Minnesota Multiphasic Personality Inventory Psychopathic Deviate scale, 170 Minnesota Multiphasic Personality Inventory-2 (MMPI-2) behavioral deviance and, 219 boldness and, 168 cultural variations in psychopathology and, 536 demoralization and, 215 disadvantages of self-report measures and, 213 overview, 247-250 Psychopathic Personality Inventory (PPI) and, 246

successful psychopathy and, 593 Triarchic Psychopathy Measure (TriPM) and, 247 Minnesota Multiphasic Personality Inventory-2 Restructured Form (MMPI-2-RF), 216-217, 246-247, 670 Minnesota Multiphasic Personality Inventory-Adolescent (MMPI-Adolescent), 552 Minnesota Temperament Inventory (MTI), 640 Minnesota Twin Family Study (MTFS) genetic factors and, 35 integrative approach and, 771-772 overview, 33 personality traits and, 34-35, 325 psychopathic personality and, 36, 37 Moderated psychopathy, 590, 591, 592-593, 594-596, 599-600. See also Successful psychopathy Modesty, 261, 265t, 267t, 273t, 274f Modified Childhood Psychopathy Scale (mCPS), 156n-157n Molecular genetic studies, 35, 340-344, 646-648. See also Genetic factors Mood clinical interviews and, 191 externalizing spectrum model and, 129 mood disorders, 174, 214-215, 718 regulation of, 202 Morality assessments in legal contexts and, 739-740 disengagement and, 594 integrated emotion systems approach and, 406 moral development, 115 moral reasoning, 61 Self-Report Psychopathy scale (SRP) and, 229t, 230t sexual coercion and, 664 socialization and, 465-466. See also Socialization successful psychopathy and, 594 Mother-child relationship, 36-37, 115. See also Maternal factors; Parentchild relationship Motivation aggression and, 614-616, 617-620 cognitive and emotional processing and, 446 control and, 98-100, 106 inhibition and, 106, 107 "mask" concept and, 6 sexual coercion and, 672 variants of psychopathy and, 324 Motivational interviewing techniques, 650 Multidimensional Inventory of Development, Sex, and Aggression (MIDSA), 662, 669, 670, 671 Multidimensional Personality Questionnaire (MPQ) affect startle modulation studies and, 433 boldness and, 171

externalizing proneness and, 129, 131, 135 female psychopathy and, 513 five-factor model (FFM) and, 269 overview, 24-25, 24f, 25f, 34 pathways to psychopathy and, 110-111, 114 personality and, 34, 36, 37, 261-262, 262t Psychopathic Personality Inventory (PPI) and, 232-233, 245-246 substance use disorders and, 638, 642 temperament dimensions and, 34, 36, 37, 95, 96, 99-100, 102 triarchic model and, 246-247 Multidomain framework, 138-139, 139f, 447 Multifaceted features, 9-10, 423-424 Multifactorial pathways model, 118 Multifinality principle, 767 Multimethod effects, 95 Multiprocess theories attention-deficit/hyperactivity disorder (ADHD) and, 106-109 overview, 590, 591-592 research regarding, 596-598 synthesis of models and, 593 See also Successful psychopathy Multisystemic therapy (MST), 372, 649, 721. 722t Murder, serial. See Serial murder Narcissicism aggression and, 620 cultural variations in psychopathology and, 539-540 developmental pathways to conduct problems and, 463 Elemental Psychopathy Assessment (EPA) and, 240, 243t externalizing psychopathology factor and, 131, 132 five-factor model (FFM) and, 266, 270, 276 Psychopathy Checklist-Revised (PCL-R) and, 68n Self-Report Psychopathy scale (SRP) and, 227t sexual coercion and, 668, 670-671 successful psychopathy and, 598 temperament dimensions and, 101, 116 trait-based approaches and, 194, 302 treatment and, 722t Triarchic Psychopathy Measure (TriPM) and, 237t, 238t Narcissistic personality disorder (NPD) boldness and, 171, 174, 180 Elemental Psychopathy Assessment (EPA) and, 242t female psychopathy and, 516 overview, 287-289 See also Personality disorders Narcissistic Personality Inventory (NPI), 287,668-669 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), 638

National Longitudinal Study of Adolescent Health, 341 National Longitudinal Survey of Youth (NLSY), 27 National Youth Survey, 367 Negative affect (NA) cognitive and emotional processing and, 445 cultural variations in psychopathology and, 556 internalizing disorders and, 291 recidivism and, 696-697 Self-Report Psychopathy scale (SRP) and, 227t successful psychopathy and, 592, 597 temperament dimensions and, 95-96, 100 Triarchic Psychopathy Measure (TriPM) and, 238t Negative emotionality (NEM) attention-deficit/hyperactivity disorder (ADHD) and, 110, 117 boldness and, 172-173 cultural variations in psychopathology and, 551, 555 developmental pathways to conduct problems and, 466 dual-disposition model and, 13 Levenson Self-Report Psychopathy Scale (LSRP) and, 222t "madness" of psychopathy and, 8 Multidimensional Personality Ouestionnaire (MPW) and, 24-25 pathways to psychopathy and, 111 Psychopathic Personality Inventory (PPI) and, 233t Self-Report Psychopathy scale (SRP) and, 227t sexual coercion and, 672 structural models of personality and, 261, 262t substance use disorders and, 637-638 successful psychopathy and, 593, 598 temperament dimensions and, 95-96, 100, 101, 103 trait-based approaches and, 302, 303 Triarchic Psychopathy Measure (TriPM) and, 238t variants of psychopathy and, 309, 321, 323t, 326 Negative Valence Systems domain, 168 - 169Neglect, 324, 358, 363-364, 519. See also Child maltreatment NEO Personality Inventory-Revised (NEO-PI-R) assessment and, 757 boldness and, 168, 173, 178 callous-unemotional traits and, 148, 157n cultural variations in psychopathology and, 552 dual-disposition model and, 13, 16 five-factor model (FFM) and, 264, 265t, 266-269, 267t, 274, 274f, 275 Psychopathic Personality Inventory (PPI) and, 232

structural models of personality and, 261, 262 subscale-level differences and, 271, 272t-273t temperament dimensions and, 96 Triarchic Psychopathy Measure (TriPM) and, 237t NEO Psychopathy Resemblance Index (NEO PRI), 148, 157n Neuroanatomical features brain deficits and impairments, 389-394 different forms of psychopathy and, 386 - 388overview, 380-386, 394 paralimbic system and, 401-403 successful psychopathy and, 596 See also Brain anatomy; Neurological factors Neurocognitive factors, 150-152, 154-156. See also Neurological factors Neuroimaging technologies callous-unemotional traits and, 151 environmental factors and, 389 externalizing proneness and, 137-138 future research and, 762 integrated emotion systems approach and, 403-404, 412-413 neuroanatomical features and, 380-386 overview, 380, 394, 401, 755, 763-766 pain processing and, 440-442 successful and unsuccessful psychopaths and, 388 youth psychopathy and disruptive behavior disorders, 494-495 See also Neurological factors Neurological factors attentional dysfunction and, 88-89 boldness and, 168, 170 callous-unemotional traits and, 148-149, 151 causes of psychopathic behavior and, 389-394 cognitive and emotional processing and, 444 core affect processing system and, 425 developmental processes and, 391-392 distress cues and, 437-439 dual-disposition model and, 17 environmental factors and, 389 externalizing proneness and, 138, 139f integrated emotion systems approach and, 403-414, 404f, 407f, 408f, 409f, 410f, 412, 413f integrative approach and, 767, 770-771 molecular genetic studies, 340-341 overview, 380-386, 394, 401, 414-415, 414f pain processing and, 439-442 paralimbic hypothesis, 401-403 psychopathy and, 114, 327, 518-519 Psychopathy Checklist-Revised (PCL-R) and, 51 response modulation hypothesis (RMH) and, 84

sexual coercion and, 664, 672 substance use disorders and, 644-646, 650 temperament dimensions and, 97-98 youth psychopathy and disruptive behavior disorders, 494-495 See also Biological factors; Neuroanatomical features; Neurocognitive factors; Neuroimaging technologies; Neurophysiological factors Neurophysiological factors externalizing proneness and, 136-137 overview, 422 substance use disorders and, 642 See also Neurological factors Neuropsychological factors comorbidity between conduct disorder and attention-deficit/hyperactivity disorder and, 461 externalizing proneness and, 128, 137 overview, 422-425 Neuroticism boldness and, 170, 172-173, 177 cultural variations in psychopathology and, 551 dual-disposition model and, 13, 14 Elemental Psychopathy Assessment (EPA) and, 240, 243t externalizing psychopathology factor and, 132, 135-136 five-factor model (FFM) and, 264, 266, 269 Levenson Self-Report Psychopathy Scale (LSRP) and, 222t narcissistic personality disorder (NPD) and, 288 personality disorders and, 275 Psychopathic Personality Inventory (PPI) and, 233t psychopathy and, 8, 112, 300, 307-309, 308f, 321, 323t Self-Report Psychopathy scale (SRP) and, 225, 227t structural models of personality and, 260, 261 subscale-level differences and, 271 substance use disorders and, 643 temperament dimensions and, 94, 95-96, 100, 103 trait-based approaches and, 302 Triarchic Psychopathy Measure (TriPM) and, 238t Neuroticism-Extraversion-Openness Personality Inventory-Revised (NEO-PI-R). See NEO Personality Inventory-Revised (NEO-PI-R) Neurotransmitters, 518-519, 647-648. See also Cortical system; Dopamine system; Serotonin system Nomological network, 170-174, 268-269, 739 Noncompliance, 712-713 Nonconformity, 338, 671 Noncriminal psychopathy, 30-31. See also Successful psychopathy

Novelty seeking attention-deficit/hyperactivity disorder (ADHD) and, 107-108 boldness and, 174, 176 developmental pathways to conduct problems and, 465 novel events, 81, 82f overview, 165 See also Sensation seeking Offender Group Reconviction Scale (OGRS), 683, 684 Openness boldness and, 172-173, 174 clinical interviews and, 191 Elemental Psychopathy Assessment (EPA) and, 243t five-factor model (FFM) and, 264, 266 Levenson Self-Report Psychopathy Scale (LSRP) and, 223t narcissistic personality disorder (NPD) and, 288 Psychopathic Personality Inventory (PPI) and, 233t Self-Report Psychopathy scale (SRP) and, 227t structural models of personality and, 261.263 temperament dimensions and, 95-96 Triarchic Psychopathy Measure (TriPM) and, 238t Oppositional defiant disorder (ODD) assessment of youth and, 486-496 attention-deficit/hyperactivity disorder (ADHD) and, 117 cognitive and emotional processing and, 492 externalizing disorders in childhood and adolescence, 105 pathways to psychopathy and, 113 temperament dimensions and, 94 youth psychopathy and disruptive behavior disorders, 480-486 Optimism, 13, 176 Orbitofrontal cortex (OFC) boldness and, 170 brain deficits and impairments, 389 callous-unemotional traits and, 151 - 152different forms of psychopathy and, 388 integrated emotion systems approach and, 407 overview, 382 paralimbic hypothesis, 402 sexual coercion and, 672 substance use disorders and, 644-645 successful psychopathy and, 596 Order, 178, 265t, 267t, 273t, 274f Overt aggression, 62, 457-458, 515. See also Aggression Oxytocin system, 150, 342-343 Pain of others, 406-407, 407f Pain processing, 229t, 439-442, 447n-448n Parent ratings, 145-146, 371, 539. See

also Informant ratings

Parent training, 154-155, 370-372, 723t Parental factors, 113, 299, 357-359, 363, 364-365. See also Family factors; Parent-child relationship; Parenting Parent-child relationship callous-unemotional traits and, 154 developmental pathways to conduct problems and, 466 mother-child relationships, 36-37, 115 overview, 358 parental conflict and disrupted families and, 364-365 psychopathic personality and, 36 psychopathy and, 300 Parenting callous-unemotional traits and, 148-149, 153-154 child abuse and neglect and, 363-364 criminality and, 27–29, 29f developmental pathways to conduct problems and, 465-467 importance of, 37 importance of fathers and, 27 Lykken's thesis and, 33-34 methodological issues and, 369-370 noncriminal psychopathy and, 30 overview, 357-363, 360f-362t, 360t, 361t, 362t parental features, 366-367 psychopathic personality and, 33-34, 36 - 37psychopathy and, 112-113, 114, 115, 299, 300 sexual coercion and, 664 social attachment and, 442 socialization and, 26-27 successful psychopathy and, 595, 599 teenage parents and, 366-367 temperament dimensions and, 117 youth psychopathy and disruptive behavior disorders, 484, 485, 491 See also Family factors; Parental factors Parietal cortex, 405, 408 Passive avoidance learning female psychopathy and, 521 Levenson Self-Report Psychopathy Scale (LSRP) and, 223t neuroanatomical features and, 382 overview, 431-432 psychopathy and, 300 response modulation hypothesis (RMH) and, 80 youth psychopathy and disruptive behavior disorders, 493 Passivity, 40, 250 Peer factors callous-unemotional traits and, 153 family factors and, 358 female psychopathy and, 522 overview, 368-369 pathways to psychopathy and, 113 psychopathic personality and, 36 rejection, 113, 515 substance use disorders and, 649 successful psychopathy and, 585, 597, 600

treatment and, 720 variants of psychopathy and, 324 Periaqueductal gray, 409, 409f, 425, 440 Perinatal risk factors, 153 Personal Opinion Study, 217 Personality Comprehensive Assessment of Psychopathic Personality (CAPP) and, 201-202 dual-disposition model and, 13, 16 - 17overview, 189, 259-260, 291-292 psychopathic personality and, 22-23 psychopathy and, 299, 513, 590 self-report measures and, 212 structural models of, 260-264, 262t substance use disorders and, 642, 643 treatment and, 718 Triarchic Psychopathy Measure (TriPM) and, 238t-239t variants of psychopathy and, 297-298 See also Psychopathic personality Personality and Personality Disorders (PPD) Workgroup for DSM-5, 757-758 Personality Assessment Inventory (PAI), 219-220, 221, 685, 742-743 Personality Diagnostic Questionnaire-Revised ASPD scale, 232 Personality Disorder Examination, 619 Personality disorders cultural variations in psychopathology and, 550 female psychopathy and, 515-516 five-factor model (FFM) and, 275 mass murderers and, 571-572 overview, 18n, 281-289, 772n Psychopathy Checklist-Revised (PCL-R) and, 48-49 role of psychopathy in the legal system and, 734 structural models of personality and, 263-264 See also Antisocial personality disorder (ASPD); Narcissistic personality disorder (NPD) Personality Inventory for DSM-5 (PID-5), 53-54, 170, 758-759 Personality Psychopathology Five (PSY-5), 757 Personality traits and factors antisocial personality disorder (ASPD) and, 54, 284 attention bottleneck and, 88 boldness and, 172-173, 181 clinical interviews and, 193-194 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 201-202 cultural variations in psychopathology and, 551 disinhibition and, 429-431 externalizing proneness and, 135-137 five-factor model (FFM) and, 276 gender differences and, 197-198 genetic factors and, 339 internalizing disorders and, 291

overview, 301-304, 304f psychopathy and, 34, 34-37, 35f, 40, 321, 323t, 324-327, 327 Psychopathy Checklist—Revised (PCL-R) and, 49-50 See also Five-factor model (FFM) Person-oriented approach, 39, 58-59, 64-67, 65f, 66f, 67f Perspective taking, 671, 724 Physical abuse brain deficits and impairments, 392 family factors and, 358 female psychopathy and, 519 gender differences and, 612 variants of psychopathy and, 324 See also Child maltreatment Physical punishment, 359, 370. See also Punishment Physiological factors callous-unemotional traits and, 152 distress cues and, 437-439 endophenotypes for antisocial behavior and, 345-346 integrative approach and, 770 psychopathy and, 327, 591, 596 Pittsburgh Youth Study (PYS) family factors and, 359, 365, 366 methodological issues and, 370 overview, 355 parental conflict and disrupted families and, 365 Psychopathy Checklist-Revised (PCL-R), 60-61 teenage parents and, 367 youth psychopathy and disruptive behavior disorders, 490-491 Planfulness, 204, 597, 615, 671 Point subtraction aggression paradigm (PSAP), 412-413 Positive emotionality (PEM) environmental factors and, 389 five-factor model (FFM) and, 265t, 267t, 274f Multidimensional Personality Questionnaire (MPW) and, 24-25 Psychopathic Personality Inventory (PPI) and, 233t structural models of personality and, 260, 261, 262t, 263 subscale-level differences and, 272t temperament dimensions and, 95-96, 100 trait-based approaches and, 302-303 variants of psychopathy and, 309, 321, 323t, 326 Positron emission tomography (PET), 380, 381, 383. See also Neuroimaging technologies Posterior cingulate, 402, 403, 404, 404f Posterior parietal cortex, 672 Posttraumatic stress disorder (PTSD), 135, 324, 623 Poverty, 536. See also Socioeconomic status (SES) PPI-FD. See Fearless Dominance (FD) factor PPI-SCI. See Self-Centered Impulsivity

(SCI) factor

Predatory aggression, 115, 116, 386–387. See also Aggression Predatory criminality, 8, 10, 11, 15-16, 17, 40. See also Criminal offenders; Criminality Predictive utility assessments in legal contexts and, 741 cultural variations in psychopathology and, 553 recidivism and, 683, 691, 692 sexual coercion and, 666-668 treatment and, 717 youth psychopathy and disruptive behavior disorders, 495-496 Prefrontal cortex (PFC) brain deficits and impairments, 394 callous-unemotional traits and, 151-152 disinhibition and, 431 high-level cognitive mechanisms and, 426-428 overview, 381-383 paralimbic hypothesis, 402 psychopathic behavior and, 390 substance use disorders and, 644-645 Prefrontal-parietal-subcortical circuit, 387 Prenatal factors, 392-393, 491 Prevalence rates cultural variations in psychopathology and, 532-536, 533t female psychopathy and, 512 integrative approach and, 768 sexual coercion and, 663-665 substance use disorders and, 638 Prevention, 370-372, 393-394, 767 Primary-secondary distinction, 299-301, 320-324, 322t-323t, 326 Proactive aggression callous-unemotional traits and, 151 Elemental Psychopathy Assessment (EPA) and, 244t overview, 458 pathways to psychopathy and, 115 Self-Report Psychopathy scale (SRP) and, 228t youth psychopathy and disruptive behavior disorders, 484 See also Aggression Prosocial behavior, 26, 484 Psychometrics, 138, 167-168, 181 Psychoneurometric dimension, 138, 139f Psychopathic personality attention bottleneck and, 88 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 201-202 five-factor model (FFM) and, 274 genetic factors and, 34-36, 35f heritability of, 36-37 overview, 22-23, 259-260 See also Personality Psychopathic Personality Inventory (PPI) affect startle modulation studies and, 433, 434-435 aggression and, 615, 616

178 callous-unemotional traits and, 147 cognitive and emotional processing and, 447n dimensionality and thresholds and, 45-46 dual-disposition model and, 13, 15 Elemental Psychopathy Assessment (EPA) and, 240, 242t ethical standards and guidelines and, 742 externalizing psychopathology factor and, 131, 132 Fearless Dominance (FD) factor and, 174 - 175female psychopathy and, 513, 517 five-factor model (FFM) and, 267t, 269 genetic factors and, 338 integrative approach and, 768-769 internalizing disorders and, 291 Levenson Self-Report Psychopathy Scale (LSRP) and, 222t method covariance and, 218 overview, 9, 220, 231-234, 233t, 245-246, 247-250, 251n, 423-424, 429 personality traits and, 34 recidivism and, 685, 697 response styles and, 212 self-report measures and, 69n Self-Report Psychopathy scale (SRP) and, 226t sexual coercion and, 663, 668, 669, 671, 672 social attachment and, 442 subscale-level differences and, 270-271, 272t-273t successful psychopathy and, 589, 592, 598 temperament dimensions and, 100-101, 101 trait-based approaches and, 301-304, 304f triarchic model and, 246-247 Triarchic Psychopathy Measure (TriPM) and, 236t unitary mechanism model and, 11 variants of psychopathy and, 307, 424-425 veridical responding and, 216 See also Self-report instruments Psychopathic Personality Inventory-Revised (PPI-R) aggression and, 615 antisocial personality disorder (ASPD) and, 54 boldness and, 167-168, 171, 175-176, 177, 179 Fearless Dominance (FD) factor and, 174-175 neuroanatomical features and, 384 overview, 220, 231-234, 233t, 758-759 recidivism and, 685 social attachment and, 443 See also Self-report instruments

antisocial personality disorder

boldness and, 167-168, 171, 175, 177,

(ASPD) and, 284-285

Psychopathic Screening Device (PSD), 487. See also Antisocial Process Screening Device (APSD) Psychopathy in adulthood, 100-104 antisocial personality disorder and (ASPD), 23 attentional moderation of psychopathic deficits, 83-86 boldness and, 175, 178 brain deficits and impairments, 389 - 394developmental trajectories to, 110-115 externalizing psychopathology factor and, 10-17, 131-134, 133f, 289-290 factors of, 387-388 female psychopathy and, 515-517 five-factor model (FFM) and, 264-268, 267t, 271, 274-276, 274f future research and, 760-763 gender differences and, 197-198 historical perspectives on, 298-299 as the interaction among personality traits, 324-327 Lykken's thesis and, 34 molecular genetic studies, 340-344 narcissistic personality disorder (NPD) and, 288 neuroanatomical features and, 382-388 noncriminal, 30-31 overview, 3-4, 40-41, 291-292, 497-498, 701, 755 paralimbic hypothesis, 402 personality traits and, 34-37, 35f primary-secondary distinction of, 299-301 Psychopathy Checklist-Revised (PCL-R) and, 52-55 recidivism and, 695-696, 700 risk assessment and, 698-699 role of in the legal system, 733-735 self-report measures and, 249-250 serial murderers and, 573-582, 577t sexual coercion and, 669-674 substance use disorders and, 639-640 successful psychopathy and, 588 twin studies and, 335-337, 337t See also Variants of psychopathy; Youth psychopathy Psychopathy Checklist (PCL) behavioral deviance and, 218-219 boldness and, 172, 179-180 cultural variations in psychopathology and, 535-537 future research and, 761 Levenson Self-Report Psychopathy Scale (LSRP) and, 222t overview, 354 PCL scales, 41-47, 43t, 44f recidivism and, 683-684, 685, 691, 696, 697, 698-699, 700-701 Self-Report Psychopathy scale (SRP) and, 226t treatment and, 715, 716-717 Triarchic Psychopathy Measure (TriPM) and, 236t See also Psychopathy Checklist-Revised (PCL-R)

Psychopathy Checklist: Screening Version (PCL:SV) aggression and, 612, 626 assessments in legal contexts and, 741 callous-unemotional traits and, 149 Cambridge Study in Delinquent Development (CSDD) and, 356-357, 357t cultural variations in psychopathology and, 536-537, 538, 542t-549t dimensionality and thresholds and, 45 - 46female psychopathy and, 510-511, 513, 514, 516, 517 four-factor model of psychopathy and, 58.62 future research and, 761 overview, 43t, 44-45, 356, 758, 772n Psychopathic Personality Inventory (PPI) and, 246 recidivism and, 688, 689, 690–691, 692, 695, 698-699 substance use disorders and, 639 successful psychopathy and, 588 treatment and, 710, 711-712, 718-719 two-factor structure and, 63 Psychopathy Checklist: Youth Version (PCL:YV) aggression and, 625 assessments in legal contexts and, 741 callous-unemotional traits and, 147, 148-149 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 207 cultural variations in psychopathology and, 538-540, 539t, 550-551, 552, 553, 557 dimensionality and thresholds and, 45-46 ethical standards and guidelines and, 744 female psychopathy and, 510-511, 514, 515, 519 four-factor model of psychopathy and, 58 overview, 43t, 45 recidivism and, 690, 692, 693-694, 695,700 substance use disorders and, 640 treatment and, 710, 719, 721 youth psychopathy and disruptive behavior disorders, 482, 486-487, 490, 491, 494, 495, 495-496 Psychopathy Checklist-Revised (PCL-R) affect startle modulation studies and, 432-435 aggression and, 611, 612, 614-615, 616-617, 619-620, 621-622, 623, 624-625 antisocial personality disorder (ASPD) and, 52-55, 282, 282-285 assessments in legal contexts and, 740.741 boldness and, 168, 171-172, 177 callous-unemotional traits and, 146 - 148

child abuse and neglect and, 363 cognitive and emotional processing and, 445 compared to self-report measures, 212 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 200, 201, 202, 206-207 criminality and, 285-286 cultural variations in psychopathology and, 529, 531-537, 533t, 541, 542t-549t, 550-553, 554-559 debates concerning, 47-52 developmental pathways to conduct problems and, 463 dimensionality and thresholds and, 45 - 46dual-disposition model and, 13, 14, 15, 16 ethical standards and guidelines and, 742-743, 744-745 externalizing psychopathology factor and, 131, 132, 289, 290 family factors and, 359 female psychopathy and, 509, 510-512, 513, 514, 516, 519, 520, 521, 522 field use of, 55-58 five-factor model (FFM) and, 264, 266 four-factor model of psychopathy and, 58-64, 60f, 62f integrative approach and, 767, 769-770 internalizing disorders and, 290, 291 in legal contexts, 736-739, 746 method covariance and, 218 narcissistic personality disorder (NPD) and, 287, 288 neuroanatomical features and, 381, 384, 387-388 overview, 9-10, 39-40, 41, 42, 43f, 43t, 44f, 67-68, 68n-69n, 291-292, 299, 355-356, 423-424, 429, 431, 732, 733, 756-757, 759 pain processing and, 440-441 PCL scales and, 41-47, 43t, 44f, 55 personality and, 34, 259-260 person-centered evidence and, 64-67, 65f, 66f, 67f psychopathy in adults and, 100 reactivity and, 437 recidivism and, 682, 683-684, 685, 686-689, 690-691, 696-697, 698-699 response bias and, 216-217 role of psychopathy in the legal system and, 734, 735 self-report measures and, 216, 248 serial murderers and, 573-582, 577t sexual coercion and, 662, 663, 664, 665, 666-667, 670, 673-674 substance use disorders and, 639, 647 successful psychopathy and, 587, 589, 592, 598 temperament dimensions and, 100-101, 102, 104, 118 trait-based approaches and, 301-304, 304f treatment and, 710, 711-712, 714, 716-717, 718, 719

triarchic model and, 246-247 unitary mechanism model and, 11 variants of psychopathy and, 307, 309, 320-321, 322t-323t, 326, 327, 424-425 youth psychopathy and disruptive behavior disorders, 481, 482, 486, 490, 491, 624-625 Psychopathy Criteria Set (PCS), 53 Psychopathy Factor 1 aggression and, 615, 616, 620, 622 assessments in legal contexts and, 740-741 cultural variations in psychopathology and, 537 female psychopathy and, 514, 521-522 neuroanatomical features and, 387-388 overview, 101-102 recidivism and, 689-690, 697 serial murderers and, 573-574, 577, 577t substance use disorders and, 639 temperament dimensions and, 103-104, 115-116, 118 treatment and, 715, 716-717, 719, 725 variants of psychopathy and, 320 Psychopathy Factor 2 aggression and, 620-621, 622 assessments in legal contexts and, 740-741 cultural variations in psychopathology and, 537, 551-552, 556 female psychopathy and, 514, 521-522 neuroanatomical features and, 387-388 overview, 101-102 recidivism and, 689-690, 697 serial murderers and, 577, 577t sexual coercion and, 667-668 substance use disorders and, 639 temperament dimensions and, 103-104, 115-117, 118 treatment and, 716-717, 719 variants of psychopathy and, 320 Psychopathy Resemblance Index (PRI), 172, 179 Psychopathy Screening Device, 437-438, 546t. See also Antisocial Process Screening Device (APSD) Psychopathy Specifier in DSM-5, 271 Psychophysiological factors callous-unemotional traits and, 153, 154, 155-156 cultural variations in psychopathology and, 553-555 externalizing proneness and, 128 response modulation hypothesis (RMH) and, 84 Psychoticism, 214–215, 227t, 238t, 260, 261 Punishment attentional moderation of psychopathic deficits, 83 callous-unemotional traits and, 150-151, 464 developmental pathways to conduct problems and, 466

family factors and, 358, 359, 363 integrated emotion systems approach and, 412 methodological issues and, 369-370 neuroanatomical features and, 384 pathways to psychopathy and, 115 successful psychopathy and, 593-594 treatment and, 712-713 youth psychopathy and disruptive behavior disorders, 491, 492-493 Race, 327, 369-370, 691-693. See also Cultural factors; Ethnicity Rape, 663-665, 668-674. See also Sexual coercion Rashness, 286-287, 288-289 Reactive aggression dual-disposition model and, 15-16 Elemental Psychopathy Assessment (EPA) and, 244t integrated emotion systems approach and, 409-410 neurological factors and, 414f overview, 458, 459, 614, 616 Self-Report Psychopathy scale (SRP) and, 228t sexual coercion and, 672-673 subtypes of psychopathy, 623 successful psychopathy and, 594, 595 treatment and, 718 violence and, 614 See also Aggression Reactive control systems, 106, 107-108 Reactive Proactive Aggression Questionnaire, 625 Reactivity aggression and, 458, 613-617 cultural variations in psychopathology and, 555 developmental pathways to conduct problems and, 466 distress cues and, 437-439 externalizing proneness and, 137 pain processing and, 447n-448n psychopathy and, 111-112, 297-298, 327, 592, 596, 599 subscale-level differences and, 270-271 temperament dimensions and, 116 youth psychopathy and disruptive behavior disorders, 492 Rebelliousness, 115, 302, 615, 642 Receiver operating characteristics (ROC) analyses, 46, 512 Recidivism aggression and, 625, 626 cultural variations in psychopathology and, 532, 553, 556, 557 female psychopathy and, 514 future directions, 700-701 incremental validity of measures of psychopathy, 694-696 meta-analyses and, 683-684 methodological factors and, 684-687 overview, 682-683, 700-701 psychopathy-violence relationship and, 696-698 risk management and, 699-700

substance use disorders and, 648-649 treatment and, 713-714, 719-720 Reckless behavior, 8, 12-13, 131-132, 202, 581, 646 Reinforcement high-level cognitive mechanisms and, 427 integrated emotion systems approach and, 404-405 neuroanatomical features and, 382, 385-386 neurological factors and, 414f reinforcement-based decision making, 410-413, 410f, 414, 414f Relational aggression, 457-458, 515, 522, 612. See also Aggression Relationships, 585, 589, 600, 616, 673. See also Romantic relationships Reliability of assessments in legal contexts, 736-737 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 206-207 cultural variations in psychopathology and, 529-530, 536-537 Psychopathic Personality Inventory (PPI) and, 232 Psychopathy Checklist: Youth Version (PCL:YV), 45 Psychopathy Checklist-Revised (PCL-R), 43-44 recidivism and, 701 self-report measures and, 212 Remorse, lack of aggression and, 612 antisocial personality disorder (ASPD) and, 8, 22 assessment and, 739-740, 743 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 202 criminality and, 286-287 cultural variations in psychopathology and, 551 dual-disposition model and, 14 narcissistic personality disorder (NPD) and, 288 PCL scales and, 41 psychopathy and, 40 response modulation hypothesis (RMH) and, 80 serial murderers and, 573 Replication, 309, 764-766 Research Diagnostic Criteria (RDC) system, 283 Research Domain and Criteria (RDoC) framework boldness and, 168 correlation among questionnaires and, 217 cross-domain assessment initiatives. 759-760 method covariance and, 218 substance use disorders and, 642 Resentfulness, 13, 115

sexual coercion and, 665-668

Respect, 30, 191 Response control systems, 105, 107-108, 413-414, 413f, 414f. See also Inhibitory control Response modulation hypothesis (RMH) attentional moderation of psychopathic deficits, 83-86 integrated emotion systems approach and, 408 mechanism of, 86-87, 87f neural mechanisms of attentional dysfunction and, 88-89 origins of, 81 overview, 80-81, 89-90 principles of, 81-83, 82f sexual coercion and, 671 stages of, 81-82, 82f Response to treatment, 496 Responsibility, 26, 579-580 Restlessness, 202, 204 Reward-based techniques, 154-155 Rewards aggression and, 613 attentional moderation of psychopathic deficits, 83 callous-unemotional traits and, 464 core affect processing system and, 425 - 426developmental pathways to conduct problems and, 466 five-factor model (FFM) and, 276 integrated emotion systems approach and, 411-412 pathways to psychopathy and, 110-111, 115 reward-seeking system, 97 sexual coercion and, 671, 672 successful psychopathy and, 593-594 temperament dimensions and, 94, 97, 115-116, 116 treatment and, 724 youth psychopathy and disruptive behavior disorders, 492-493 Risk assessment assessments in legal contexts and, 737-738 Psychopathy Checklist-Revised (PCL-R), 46-47 recidivism and, 684, 695, 698-699 sexual coercion and, 666-668 See also Assessment Risk factors Cambridge Study in Delinquent Development (CSDD) and, 356 family factors and, 354-355, 360f-362t onset of conduct problems in childhood and adolescence and, 459, 459-460 overview, 369 peer, school, and neighborhood factors, 368-369 Psychopathy Checklist-Revised (PCL-R), 65 recidivism and, 695-696 socioeconomic status and, 367-368 substance use disorders and, 643 temperament dimensions and, 94 trait-based approaches and, 302

treatment and, 713-714 youth psychopathy and disruptive behavior disorders, 491 See also Vulnerabilities Risk for Sexual Violence Protocol (RSVP), 698 Risk management and reduction, 699-700, 715-717, 721. See also Treatment Risk-Need-Responsivity (RNR) model. See RNR (Risk–Need–Responsivity) model Risk-taking antisocial personality disorder (ASPD) and, 23, 284 assessment and, 758 boldness and, 175-176 female psychopathy and, 518 sexual coercion and, 672 Triarchic Psychopathy Measure (TriPM) and, 239t youth psychopathy and disruptive behavior disorders, 485 RNR (Risk-Need-Responsivity) model, 711, 712, 716, 721, 724 Rochester Youth Development Study, 368-369 Romantic relationships, 589, 600. See also Relationships Rule breaking, 8, 26, 481, 672 Sadism, 618-620, 670, 673-675 Schizophrenia aggression and, 626 antisocial personality disorder (ASPD) and, 22 brain deficits and impairments, 392 core affect processing system and, 426 genetic factors and, 347 neuroanatomical features and, 383-384 overview, 772n successful psychopathy and, 585 School achievement/engagement, 36, 105-106, 113, 358 School factors, 168-170 Screening Personality Questionnaire for the Structured Clinical Interview for DSM-IV Axis II Disorders, 758-759 Selective attention, 86-87, 87f, 88-89 Self functioning, 202, 203f, 698 Self-assurance, 240, 291 Self-Centered Impulsivity (SCI) factor affect startle modulation studies and, 433 aggression and, 615, 616 boldness and, 168, 176-177, 178 Elemental Psychopathy Assessment (EPA) and, 242t five-factor model (FFM) and, 276 overview, 9, 423-424 Psychopathic Personality Inventory (PPI) and, 231, 232-233 recidivism and, 685, 697 sexual behavior, 176-177, 663 social attachment and, 443 subscale-level differences and, 270-271

successful psychopathy and, 589 Triarchic Psychopathy Measure (TriPM) and, 236t unitary mechanism model and, 11 variants of psychopathy and, 307-309, 308f See also Impulsive-antisocial factor (of psychopathy) Self-consciousness dual-disposition model and, 13 five-factor model (FFM) and, 265t, 267t, 274f Levenson Self-Report Psychopathy Scale (LSRP) and, 223t personality disorders and, 275 subscale-level differences and, 272t Self-contentment, 240, 291 Self-directed aggression, 135, 522, 620-624. See also Aggression Self-discipline, 264, 265t, 267t, 269, 273t, 274f Self-esteem, 176, 301 Self-harm behavior. See Self-directed aggression Selfishness, 40, 41, 270-271, 580 Self-perceptions, 287-288, 484 Self-regulation, 98-99, 235, 390, 485 Self-report instruments advantages of, 211-212 aggression and, 615 attention-deficit/hyperactivity disorder (ADHD) and, 106-107 callous-unemotional traits and, 148 cultural variations in psychopathology and, 551-552 disadvantages of, 213-215, 214f empirical problems in, 217-220 externalizing psychopathology factor and, 131, 132 future directions, 247-250 gender differences and, 612 integrative approach and, 768-769, 770 limitations of, 248-249 misconceptions and misunderstandings regarding, 215-217 overview, 211, 220, 245-250, 758 overview of select measures, 220-221, 222t-223t, 224-225, 226t-230t, 230-235, 233t, 236t-239t, 239-240, 241t-244t, 245-247 Psychopathy Checklist-Revised (PCL-R), 59, 69n recidivism and, 685, 686, 687-688 sexual behavior and, 176-177, 664, 665 temperament dimensions and, 95-96 trait-based approaches and, 302 See also individual instruments Self-Report Psychopathy scale (SRP, SRP-II, SRP-III, SRP-4) aggression and, 620 antisocial personality disorder (ASPD) and, 54 boldness and, 171-172, 175 correlation and, 217 cultural variations in psychopathology and, 535, 545t, 547t, 550

dimensionality and thresholds and, 45-46 dual-disposition model and, 13 Elemental Psychopathy Assessment (EPA) and, 240, 241t-242t, 245 female psychopathy and, 510-511, 512, 513, 516, 520 five-factor model (FFM) and, 266, 267t, 269, 274 four-factor model of psychopathy and, 58, 62 integrative approach and, 768-769, 770 internalizing disorders and, 291 Levenson Self-Report Psychopathy Scale (LSRP) and, 222t neuroanatomical features and, 385 overview, 9, 68n, 220, 224-231, 226t-230t, 247-250, 250n-251n, 423 pain processing and, 441, 447n-448n Psychopathy Checklist-Revised (PCL-R), 59, 61 recidivism and, 687-688 sexual coercion and, 668, 669, 670 structural equation modeling (SEM) analysis of, 60-61 subscale-level differences and, 270-271, 272t-273t triarchic model and, 246-247 Triarchic Psychopathy Measure (TriPM) and, 237t veridical responding and, 215-216 See also Self-report instruments Self-Report Psychopathy scale—Short Form (SRP-SF), 60-61, 668-669 Sensation seeking cultural variations in psychopathology and, 555–556 Levenson Self-Report Psychopathy Scale (LSRP) and, 223t Psychopathic Personality Inventory (PPI) and, 233t Self-Report Psychopathy scale (SRP) and, 227t serial murderers and, 582 sexual coercion and, 672 temperament dimensions and, 101 treatment and, 726n Triarchic Psychopathy Measure (TriPM) and, 239t youth psychopathy and disruptive behavior disorders, 485 Sensation-Seeking Scale (SSS), 217, 218-219 Sensory systems, 86-87, 426 Separation, 364-365. See also Family factors Septo-hippocampal-orbitofrontal (SHF) system, 81, 88, 97-98 Serial murder compared to mass murder, 571-572 heterogeneity and, 572 overview, 570-571, 582 psychopathy and, 573-582, 577t research regarding, 572-573, 576-582, 577t scope of, 571 violence and, 573-574

Serotonin system callous-unemotional traits and, 150 female psychopathy and, 518-519 molecular genetic studies, 341, 342 substance use disorders and, 647, 648 Set-shifting, 107, 644 Severe Sexual Sadism Scale (SSSS), 674 Sexual abuse brain deficits and impairments, 392 developmental pathways to conduct problems and, 463 family factors and, 358 female psychopathy and, 519 overview, 363-364 thrill seeking and, 618 variants of psychopathy and, 324 See also Child maltreatment Sexual behavior aggression and, 618-619 deviance and, 7, 688-689 sadism and, 618-619 serial murderers and, 574 successful psychopathy and, 589 Sexual coercion new developments in, 669-674 overview, 662, 674-675 prevalence of, 663-665 psychometric correlates of, 668-669 psychopathy among rapists, 665-668 recidivism and, 688-689 See also Criminality; Sexual offenders Sexual offenders developmental pathways to conduct problems and, 463 legal factors and, 733-734 recidivism and, 688-689, 693 thrill seeking and, 618 See also Sexual coercion Sexual Risk Survey, 176 Sexual risk taking, 175-177, 324, 518, 522. See also Risk-taking Sexual violent predator (SVP), 735 Sexual Violent Risk-20 (SVR-20), 683 Sexually violent predator (SVP) evaluations, 56 Shallow emotions Comprehensive Assessment of Psychopathic Personality (CAPP) and, 202 cultural variations in psychopathology and, 551 female psychopathy and, 510 treatment and, 718 youth psychopathy and disruptive behavior disorders, 482, 491 Shallow-deceptive features, 4-6, 5t, 10-11, 14 Shame, 13, 14, 40, 298 Siblings, 358, 360f-362t Single-nucleotide polymorphisms (SNPs) disinhibition and, 431 genetic factors and, 342, 344 neuroanatomical features and, 383 overview, 346-347 psychopathic personality and, 35-36, 35f social attachment and, 444

Single-photon emission computerized tomography (SPECT), 380, 381. See also Neuroimaging technologies Skin conductance responses, 80, 494 Sociability, 227t, 238t Social factors attachment and, 442-443 boldness and, 167, 177 criminality and, 31n cultural variations in psychopathology and, 540 dual-disposition model and, 14 family factors and, 359, 363 genetic factors and, 338 integrated emotion systems approach and, 404-405 PCL scales and, 41 Psychopathic Personality Inventory (PPI) and, 231 psychopathy and, 40 Psychopathy Checklist-Revised (PCL-R) and, 48-49 Self-Report Psychopathy scale (SRP) and, 225 structural models of personality and, 260, 261, 262, 262t substance use disorders and, 636-637 temperament dimensions and, 118 Triarchic Psychopathy Measure (TriPM) and, 235 Social skills externalizing psychopathology factor and, 105-106 "mask" concept and, 5-6 pathways to psychopathy and, 113 peer, school, and neighborhood factors, 368 serial murderers and, 581 successful psychopathy and, 585, 592, 596 variants of psychopathy and, 324 Socialization callous-unemotional traits and, 469 criminality and, 28-29, 29f developmental pathways to conduct problems and, 465-466, 469 failure of, 26-27 female psychopathy and, 510, 513 noncriminal psychopathy and, 30 overview, 25-26, 37 psychopaths and, 23 recidivism and, 690 successful psychopathy and, 591 undersocialized and socialized subgroups of antisocial youth, 462-463 unitary mechanism model and, 11 Societal conventions, 40, 465 Sociobiological model, 589 Socioecological niche filling, 596, 598 Socioeconomic status (SES) callous-unemotional traits and, 148-149, 150, 153 Cambridge Study in Delinquent Development (CSDD) and, 356 cultural variations in psychopathology and, 536, 540, 553, 556, 557 family factors and, 358, 360f-362t

Socioeconomic status (SES) (cont.) methodological issues and, 369 overview, 367-368 psychopathy and, 298, 299, 595, 599, 600 teenage parents and, 366-367 Sociopaths, 8, 23, 33-34, 64-65, 65f, 734 Sociosexual Orientation Inventory, 176 Somatization disorders, 215, 517 Spousal Assault Risk Assessment (SARA), 683 Startle response cultural variations in psychopathology and, 554-555 endophenotypes for antisocial behavior and, 345-346 overview, 432-434, 447n Psychopathic Personality Inventory (PPI) and, 245-246 response modulation hypothesis (RMH) and, 80 temperament dimensions and, 101 unitary mechanism model and, 11 Stimulation seeking, 63, 390, 485 Straightforwardness clinical interviews and, 191 five-factor model (FFM) and, 265t, 267t, 274f structural models of personality and, 261 subscale-level differences and, 273t Strengths and Difficulties Questionnaire (SDQ), 145, 339 Stress dual-disposition model and, 13 life events, 36 stress immunity, 13, 167, 338 structural models of personality and, 260, 262, 262t successful and unsuccessful psychopaths and, 388 successful psychopathy and, 592 Triarchic Psychopathy Measure (TriPM) and, 235 Striatum, 385-386, 388, 403, 410-411, 412 Structural equation modeling (SEM) antisocial behavior and, 49 assessment and, 736-737, 744 Psychopathy Checklist-Revised (PCL-R) and, 39, 59, 60-61, 62, 64 sexual coercion and, 669-670, 671, 673, 674 variants of psychopathy and, 305-306 See also Factor analysis Structural magnetic resonance imaging (sMRI), 387, 402, 403. See also Neuroimaging technologies Structural models, 260-264, 262t, 302 Structured Assessment of Violence Risk in Youth (SAVRY), 683, 684, 699 Structured Clinical Interview for DSM Axis II Disorders (SCID-II), 669, 758 Structured Clinical Interview for DSM-IV, 356 Subclinical psychopathy, 590-591, 592-594. See also Successful psychopathy

Substance abuse core affect processing system and, 426 cultural variations in psychopathology and, 553 dependence and, 402 Elemental Psychopathy Assessment (EPA) and, 243t externalizing psychopathology factor and, 130f, 131, 133f, 134-135 Externalizing Spectrum Inventory (ESI) and, 130-131, 133-134, 637-638 family factors and, 358 integrated emotion systems approach and, 411 onset of conduct problems in childhood and adolescence and, 459 overview, 289 by parents, 367 substance-related problems, 16 successful psychopathy and, 598 temperament dimensions and, 102 trait-based approaches and, 302, 303 See also Addiction; Substance use disorders (SUDs) Substance use disorders (SUDs) clinical implications, 648-650 comorbidity and, 637-650 cultural variations in psychopathology and, 553 externalizing disorders and, 289-290 "madness" of psychopathy and, 7 overview, 289, 635-637, 650 trait-based approaches and, 302 See also Addiction; Alcohol abuse and dependence; Drug abuse and dependence; Substance abuse Subtypes of psychopathy. See Variants of psychopathy Successful psychopathy aggression and, 613 future directions, 599-600 models of, 590-599 neuroanatomical features and, 388 overview, 585-590, 599-600 research regarding, 593-599 Suicidal ideation and behavior aggression and, 620 dual-disposition model and, 13 externalizing proneness and, 134, 135 female psychopathy and, 516, 517, 518 "madness" of psychopathy and, 8 successful psychopathy and, 598 Supervision, parental, 358-359, 363 Suppressor effects, 13, 18n, 177 Swedish Twin Study of Child and Adolescent Development (TCHAD), 771-772 Syndromal status of psychopathy, 177-180 Taylor aggression paradigm (TAP), 412 - 413Teacher ratings, 145-146, 156n. See also Informant ratings

Teenage parents, 27, 366–367. See also Family factors

Temperament callous-unemotional traits and, 152-153 criminality and, 27-29, 29f developmental processes and, 110-115, 465-466 dimensions of, 94-110 dual-disposition model and, 16-17 importance of fathers and, 27 overview, 115-118 psychopathy and, 23, 300 variants of psychopathy and, 297-298 Temporal cortex, 383, 403, 404, 404f Tender-mindedness, 261, 265t, 267t, 273t, 274f Theory of mind, 403-404, 494-495, 589 Therapeutic relationships, 191-192 Therapists, 714-715, 743-744 Threat sensitivity, 17, 84, 88, 96-97, 104, 424, 428, 433-434, 437, 672-673, 769. See also Defensive processes; Fear; Fear reactivity Three-factor model aggression and, 615 callous-unemotional traits and, 146 Levenson Self-Report Psychopathy Scale (LSRP) and, 221, 224 overview, 260 Psychopathy Checklist-Revised (PCL-R), 42-43, 43t, 44f, 63 recidivism and, 692, 697 sexual coercion and, 668 successful psychopathy and, 593 temperament dimensions and, 95-96 Thrill seeking aggression and, 618 Elemental Psychopathy Assessment (EPA) and, 240 internalizing disorders and, 290-291 Levenson Self-Report Psychopathy Scale (LSRP) and, 223t psychopathy and, 40, 111 Self-Report Psychopathy scale (SRP) and, 228t temperament dimensions and, 101, 116 trait-based approaches and, 302 Triarchic Psychopathy Measure (TriPM) and, 239t Top-down attention, 408-409 Top-down control, 106, 107, 200, 427-428. See also Inhibitory control; Response control systems Toronto Alexithymia Scale (TAS), 513 Tough-mindedness, 261 Traditionalism, 260, 262, 262t Trail Making Test B, 107 Trait disinhibition, 429-431. See also Disinhibition Trait-based approaches, 301-304, 304f Transactional process, 112-113, 596 Transdiagnostic approach, 642 Trauma, 324, 365 Treatment of adults with psychopathy, 712-718 assessments in legal contexts and, 738-739 brain deficits and impairments, 393-394

Unreliability, 40, 202, 288-289

Unrestrained behavior, 111-112

callous-unemotional traits and, 154-155, 156 with criminal offenders, 711-713 family-based prevention, 370-372 female psychopathy and, 513-514 future directions, 724-726, 762-763 integrative approach and, 767 legal factors and, 733 motivation and, 324 overview, 710-711 sensation seeking and, 726n substance use disorders and, 638, 648-650 variants of psychopathy and, 718-719 youth psychopathy and disruptive behavior disorders, 719-725, 722t-723t, 762-763 Treatment foster care (TFC), 372 Triarchi Psychopathy Measure (TriPM), 16, 132, 170 Triarchic model antisocial personality disorder (ASPD) and, 284-285 biobehavioral trait approach and, 17 boldness and, 13-14 causal mechanisms and, 16-17 cognitive and emotional processing and, 425-429, 446 core affect processing system and, 426 cross-domain assessment initiatives, 759-760 dual-disposition model and, 14 externalizing spectrum model and, 132-133, 133f five-factor model (FFM) and, 276 internalizing disorders and, 291 overview, 10, 17, 68n, 246-247, 423 pathways to psychopathy and, 114-115 recidivism and, 698 serial murderers and, 581 sexual coercion and, 674 social attachment and, 443 successful psychopathy and, 592, 598 temperament dimensions and, 103-104 trait-based approaches and, 303 variants of psychopathy and, 425 See also Boldness; Disinhibition; Meanness Triarchic Psychopathy Measure (TriPM) aggression and, 615 antisocial personality disorder (ASPD) and, 54 boldness and, 178, 179 callous-unemotional traits and, 147 cultural variations in psychopathology and, 538 distress cues and, 439 dual-disposition model and, 13 ethical standards and guidelines and, 742 Fearless Dominance (FD) factor and, 174 - 175five-factor model (FFM) and, 266, 267t integrative approach and, 768-769 internalizing disorders and, 291 overview, 220, 235-239, 236t-239t, 246-250, 424, 758-759

pain processing and, 447n-448n Psychopathy Checklist-Revised (PCL-R), 63 recidivism and, 698, 701 social attachment and, 442 subscale-level differences and, 270-271, 272t-273t trait-based approaches and, 301-304, 304f variants of psychopathy and, 424-425 See also Self-report instruments Triple-P Positive Parenting program, 371 Triple-process theory, 249–250 Trust boldness and, 180 clinical interviews and, 193 dual-disposition model and, 13 five-factor model (FFM) and, 265t, 267t. 274f self-report measures and, 250 structural models of personality and, 261 subscale-level differences and, 273t Twin studies brain deficits and impairments, 393 callous-unemotional traits and, 149-150 correlations and, 353 criminality and, 29-30, 30t externalizing psychopathology factor and, 129, 130 integrative approach and, 771-772 Lykken's thesis and, 34 overview, 335-337, 337t personality and, 34-36, 35f, 37, 325 See also Genetic factors Twin Study of Child and Adolescent Development (TCHAD), 771-772 Twins Early Development Study (TEDS), 339, 771-772 Two-factor structure aggression and, 615 cultural variations in psychopathology and, 541 female psychopathy and, 511 Psychopathy Checklist-Revised (PCL-R), 42-43, 43t, 44f, 63 response modulation hypothesis (RMH) and, 83 temperament dimensions and, 95-96 Two-path confluence model, 668 Two-process theory, 592, 593, 596, 597-598,644 Ultimatum Game, 645 Uncaring, 202, 270-271, 484-485 Unemotional tendencies cognitive and emotional processing and, 446 dual-disposition model and, 15 Psychopathy Checklist-Revised (PCL-R), 68n serial murderers and, 573, 581 temperament dimensions and, 103-104 Uniform Crime Report (UCR) Index Crimes, 23 Unlikely Virtues scale, 177

Unstable lifestyle, 41, 302 Validity of assessments in legal contexts, 737-739 Comprehensive Assessment of Psychopathic Personality (CAPP) and, 205-207 cultural variations in psychopathology and, 529-530, 541, 542t-549t, 550-559 Elemental Psychopathy Assessment (EPA) and, 240 female psychopathy and, 510-512 Psychopathic Personality Inventory (PPI) and, 232, 234 Psychopathy Checklist (PCL), 42 Psychopathy Checklist: Youth Version (PCL:YV), 45 recidivism and, 694-696, 701 self-report measures and, 251n variants of psychopathy and, 309 Values, 265t, 267t, 273t, 274f Variants of psychopathy aggressive behavior and, 457-459 developmental processes and, 456-457 finding subtypes, 304-309, 308f future directions, 327-328 overview, 297-298, 325-327, 328n, 424-425, 448n research investigation of psychopathy subtypes, 309, 310t-319t, 320-324, 322t-323t subtypes of psychopathy, 623 treatment and, 718-719 undersocialized and socialized subgroups of antisocial youth, 462-463 variable selection and, 307-309, 308f See also Psychopathy Ventromedial prefrontal cortex (vmPFC) callous-unemotional traits and, 151-152 causes of psychopathic behavior and, 389 integrated emotion systems approach and, 404, 404f, 410-411, 410f paralimbic hypothesis, 402-403 substance use disorders and, 644-645 Venturesomeness, 13, 165. See also Boldness; Daringness Verbal IQ, 111, 113. See also IQ Victim detection, 230t, 673 Vindictiveness, 303, 481 Violence aggression and, 619-620 biosocial perspective, 389 developmental pathways to conduct problems and, 463 Elemental Psychopathy Assessment (EPA) and, 244t genetic factors and, 341 motivations for, 614-616 neuroanatomical features and, 381, 382, 383, 386-387

Violence (cont.) overview, 17, 612 from a psychopath's perspective, 621-622 psychopathy and, 115, 299, 513-514, 515, 516, 517, 522, 532, 552, 553 Psychopathy Checklist-Revised (PCL-R), 62, 62f, 65 recidivism and, 686, 690-691, 696-698,701 risk management and, 699-700 Self-Report Psychopathy scale (SRP) and, 229t serial murderers and, 573-574 sexual coercion and, 674-675 trait-based approaches and, 303 treatment and, 711-713, 722t-723t youth psychopathy and disruptive behavior disorders, 484 See also Aggression; Intimate partner violence Violence inhibition mechanism (VIM) model, 276, 437 Violence Risk Appraisal Guide (VRAG) assessments in legal contexts and, 741 ethical standards and guidelines and, 742 recidivism and, 683, 684, 698 Violence Risk Scale (VRS), 713-714, 718 Violence Risk Scale—Sex Offender (VRS-SO), 713-714

Volitional impairment, 734, 740

Vulnerabilities callous-unemotional traits and, 149–154 five-factor model (FFM) and, 265t, 267t, 274f personality disorders and, 275 Self-Report Psychopathy scale (SRP) and, 230t subscale-level differences and, 272t See also Risk factors

Warmth, 267t, 272t, 274f, 589
Webster-Stratton parent training program, 371
Well-Being, 260, 262, 262t, 457
Wisconsin Card Sorting Test, 388, 595
Withdrawal, 106–107, 271, 324, 758

Youth Level of Service/Case Management Inventory (YLS/ CMI), 683, 693, 698–699, 741
Youth Psychopathic Traits Inventory (YPI) boldness and, 172
callous-unemotional traits and, 146, 147
cultural variations in psychopathology and, 538, 540, 546t–549t, 552
dimensionality and thresholds and,

45–46 dual-disposition model and, 13 five-factor model (FFM) and, 266, 267t, 269

integrative approach and, 768-769 Levenson Self-Report Psychopathy Scale (LSRP) and, 222t overview, 9, 423 recidivism and, 693, 695 subscale-level differences and, 270-271, 272t-273t substance use disorders and, 640 triarchic model and, 246-247 Triarchic Psychopathy Measure (TriPM) and, 237t, 247 variants of psychopathy and, 424-425 youth psychopathy and disruptive behavior disorders, 486, 488-489, 491-492 Youth psychopathy aggression and, 624-625 assessment and, 486-496 cultural variations in, 537-541, 539t, 546t-549t future research and, 762-763 overview, 479-480, 701n psychopathy and disruptive behavior disorders and, 480-486 recidivism and, 693-694, 701 recommendations regarding, 496-498 successful psychopathy and, 598 treatment and, 719-725, 722t-723t See also Adolescence; Childhood; Psychopathy

genetic factors and, 338-339