

## The Scientific Proof of God

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**Abstract:--** This paper follows The Cartesian Theory (Hammond, *New Ideas in Psychology* Vol. 12(2), 1994) which advanced 3-axis brain cleavage as the cause of the Structural Model. This second paper reports gravitational curvature in the brain. Intelligence plus Personality form a 4D space. The eigenvector of the 4x4 metric is the Secular Trend and Einstein curvature  $G_{uv}$  of linearized gravity. Penrose's quantum brain gravity is the source thus confirming the Hameroff-Penrose model. This factor proves to be the classical "God" of history. A causal link between Relativity and the Structural Model yields the world's first experimentally confirmed scientific proof of God.

### **I Introduction: George Gamow's relativistic world of Mr. Tompkins.**

Sir Roger Penrose was the first to suggest that gravity controls the human brain (Penrose 1989, 1994). Many scientists are skeptical. In a 1994 lecture at the Isaac Newton Institute Stephen Hawking made the following comment to Roger Penrose: "One doesn't need quantum gravity to explain Schrodinger's cat or the operation of the brain. It is a red herring." (Hawking and Penrose 1996, p. 121). The discovery reported here suggests that Stephen Hawking is wrong, at least about the human brain, and Roger Penrose is correct. The reason is that Psychometry has uncovered an enormous relativistic curvature in brain function. Classical gravity being eliminated, we are left to conclude that quantum gravity somewhere in the brain must be the cause. Coincidentally then, the natural candidate for this phenomena is Roger Penrose's quantum brain gravity hypothesis.

If that was all, perhaps a mere Psychometry discovery would only be of passing interest, however this discovery includes a truly breath taking corollary. It is elementary to show that the discovery of a curvature in psychometry space yields a stunning explanation of "God". In view of this startling development, the fact that gravitational curvature only appears as a

factor analytic identification becomes an objection that pales into insignificance.

Given the novel claims of this paper, it is relevant to mention that there is an intriguing historical background. In 1940, the famous Russian-American physicist George Gamow wrote a fictional story about a world where the speed of light was only 10 miles per hour (Gamow and Stannard 1999). Because of this, people could actually *see* relativity. Relativity caused people to shrink in size and behave oddly. According to the present theory, Gamow's world is real, but the cause of this dramatic effect is General Relativity, not Special Relativity. It is Gravity that is vastly altered, not the speed of light. Unknown to Gamow, quantum gravity in the brain produces an enormous classical curvature in *perceptual reality*, drastically changing the visible size and speed of the world. We now realize why Gamow's story captured the public imagination and has passed through 20 printings. Gamow was describing "God".

Before leaving this introduction I should mention the title *The Scientific Proof of God*. Today it is absurd to believe that anyone could claim priority in such a discovery. For one thing, if God is explained by gravity Albert Einstein or even Isaac Newton by discovering the theory of gravity must be given that priority. Interestingly, Einstein, a firm believer in God stated that he believed in a Cosmical God but not a Personal God (Jammer 1999). The term Personal God refers to an anthropomorphic deity, that is God in the form of an *invisible man*. It is historical irony then that this paper not only proves God really is an invisible man, but identifies Einstein's theory as the proof of it.

With that, we turn to a presentation of this newly discovered theory. We begin with a brief explanation of what Psychometry is, and then move on to the central psychometric result itself and its connection to the theory of General Relativity.

## **II Discovery of the Structural Model of Personality.**

The author is a physicist and this paper is written primarily for physicists. This makes explaining a linear algebra theory like Psychometry<sup>1</sup> a simple task. In fact, a physicist can easily comprehend this entire thesis once he has been briefed on Psychometry. The theory is based on the discovery that the orthogonal cleavages of human anatomy, specifically in the brain, cause the orthogonal eigenvectors of Psychometry. The geometry is 4-dimensional and mathematically identical to what physicists call "linearized gravity". The reason for this is that the orthogonal structure of real space is the cause of the orthogonal structure of human anatomy (Hammond 1994). As Relativists know, the eigenvector of the spacetime metric is caused by mass and is called Gravity. As we shall demonstrate, the eigenvector of the psychometry metric

is caused by brain growth and is called "God". Since real space *causes* psychometry space<sup>3/4</sup> God is caused by Gravity. Penrose's brain gravity is identified as the (semiclassical) source of this curvature. Now, compared to contemporary physics this is an elementary theory. How could such an elementary result lie undiscovered until 2003? The reason is that Psychology is statistics and required computers capable of diagonalizing a 200'200 matrix and 40 years of psychometrists using them testing millions of people, to finally allow Physics to recognize this structure.

Having explained this theory in a single paragraph I'm sure it raises a host of questions in the minds of most scientists. That is why we must spend 10 more pages examining details and explaining how an invisible man, the God pictured on the Sistine Chapel ceiling, actually exists and is caused by Gravity. We begin with a briefing on what the science of Psychometry is.

Psychometry is the field of psychology measurement; mainly IQ and Personality tests. The Stanford-Binet and Wechsler IQ tests, the Minnesota Multiphasic Personality Test are well known examples.

Modern Psychometry is based on the linear algebra of *Factor Analysis*, the Factor Analysis of written questionnaires mainly. As a simple heuristic example, an unabridged dictionary contains roughly 4,000 adjectives describing human personality (Allport and Odbert 1936). A core list of about 200 substantially describes it. These are words such as:

raffish, effete, hidebound, taciturn, optimistic, facetious, congenial, flamboyant, impudent, gullible, suspicious, skeptical, naive, prudish, jovial, witty, smug, pompous, gregarious, polite, cynical, .... etc.

By making up a simple 200 word Adjective Checklist and giving it as a test to 5,000 people with instructions to score each adjective from -5 to +5 as to how well it describes themselves, one can compute the correlation coefficients (of described behavior) between the 200 adjectives. In this case such a procedure yields a 200'200 correlation matrix describing human personality (Goldberg 1994, Cattell 1973).

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(1) "Psychometry has two definitions. Here we are discussing mental measurements (IQ, Personality tests etc.). To avoid possible confusion the term *Psychometrics* is often used.

Factor Analysis is the method by which the *Structural Model of Personality* is deduced from the matrix. Every real symmetric matrix has what are known as eigenvectors. This correlation matrix is a scalar product matrix where each adjective is modeled as a vector in a vector space. The correlation coefficient is the cosine of the angle between vectors. If all the correlations were zero the space would be 200 dimensional, but because most of the correlations are nonzero the vectors occupy far less than 200 dimensions. The Rank of the matrix is the dimensionality of the space, the

Rank being identical to the number of eigenvectors since the eigenvectors are coordinate axes of the space. A modern desktop computer can easily determine the Rank and extract the eigenvectors. This is called "Factoring" the matrix. This vector space is referred to as "Psychometry space" and every point in it represents a different personality type as measured by the coordinate axes of the space.

Suppose the Rank of the matrix turned out to be three<sup>2</sup>. Then what we would know is that the Structural Model of Personality is 3-dimensional. One might be able to discover this using psychoanalysis (Freud did apparently, the Tripartite Model), but there is no way to measure it. Psychometry is a way of measuring it. Further, by observing which of the 200 vectors load on each of the 3 dimensions, we can identify the 3-dimensions. That is, we can discover the names of the 3-dimensions

Incidentally, one can see that there is nothing psychoanalytical about this procedure. It involves only the simple categorization of objectively visible human behavior on a large statistical basis. To that extent it is a scientifically "metrical" procedure. While Freudian Psychology belongs to a premetrical era, the invention of Psychometry early in the last century marks the beginning of the modern *metrical era*. Largely as a result of this, and advances in Brain Science, in 1982 the prestigious International Council of Scientific Unions (ICSU) admitted the International Union of Psychological Sciences (UPsyS) to full membership, de facto recognizing Psychology as a "science". Meanwhile, 70 years of research by many thousands of investigators in an enormous peer reviewed academic literature, has actually confirmed that personality space is 3-dimensional, and these 3 dimensions have been named E, N, and P; Extraversion, Neuroticism and Psychoticism (Eysenck 1990)<sup>3</sup>. Of course the methodology now extends to elaborately written modern questionnaires not merely adjective checklists, and includes sophisticated physiology methods also (Eysenck 1990, Cattell 1973). However, there is still something missing which makes the discovery fall short of a scientific law. No one can explain why personality should be 3dimensional. Until that is discovered, we do not have a scientific law.

This is where the author's preliminary paper comes in (Hammond 1994). In that paper I published the first experimentally confirmed explanation of why the 3-dimensional result exists. I showed that the 3-Factor result is caused by the 3-axis anatomical cleavage of the brain. The 3-axis orthogonal cleavage of the brain is caused by the 3-axis structure of space, hence<sup>3/4</sup> Personality is 3dimensional because space is 3-dimensional. As we are about to see, this *axiomatic* principle turns out to be the master key which unlocks the world's first scientific proof of God.

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(1) Actually the rank is about 30 and these are called the 1st order Factors (eigenvectors). After "rotation and refactoring", 13-2nd order Factors are found, then 4-3rd order Factors, and finally 1-4th order Factor (Cattell 1973). ENPg are both 2nd and 3rd order Factors [1]. This is discussed in Sections IV and VI.

(2) Eysenck's ENP are identified as Cattell's 2nd order Factors QI, QII, QIV (Exvia, Anxiety, Independence) by both Cattell and Eysenck in the case of E and N, and by the author in the case of P.

There is much more to this 3-dimensional discovery and it is detailed in my 1994 paper. Besides the 3-orthogonal dimensions E,N,P, there are also 10 oblique dimensions. I showed in that paper and in subsequent work, that all 13 of these experimentally known dimensions are (correlationally) the 13 symmetry axes of a cube. E,N,P are simply the 3 normals of the cube, the *Principal Axes* of personality space. For decades Factorists have been arguing over whether there are 3, 4, 5, 7, 9 or 13 dimensions (Eysenck 1991). My paper resolved the entire problem by showing that everyone is right, and that all the different models are simply geometrical redactions of a cube. This is due as I have shown, to the fact that the human brain is structurally cubic, possessing the 8 corner octants (brain lobes) of a cube. This resolution of the Structural Model controversy is overwhelming experimental support for the present theory. At this point I will have to refer the reader to the original paper (Hammond 1994) as we must move forward to the topic of this paper, the scientific explanation of God.

### **III That the unification of Personality and Intelligence is caused by Einstein's unification of space and time.**

Intelligence and Personality are two different phenomena. Historically, Psychometry is divided into two eras. 1900-35 saw the study of Intelligence by Sir Francis Galton, Karl Pearson, Charles Spearman and Sir Ronald Fisher whom founded Statistics and Factor Analysis and which produced the modern IQ test by 1935. After that, Louis Thurstone, R. B. Cattell and Hans Eysenck turned this new mathematics on personality research, which with the aid of modern computers resulted in the discovery of E,N,P in Personality by 1990. Until now it has never been suspected that there might be a structural connection between Intelligence and Personality, but as we are about to see, there is. This connection turns out to be the same as the connection between Time and Space, discovered by Albert Einstein!

I discovered this connection quite by accident 3 years after the publication of the Cartesian Theory. I discovered some advanced research by Raymond

B. Cattell the most accomplished experimentalist ever to investigate Psychometry. His research indicated that there were 4 factors, not 3 (Cattell 1975) [1]. Since I had just published that the 3 dimensions of space XYZ cause ENP, it seemed impossible that there could be 4 dimensions. Then I noticed that Cattell had included Intelligence in his factor analysis, and I suddenly realized that the Structural Model was not only caused by the 3 dimensions of space, but that all 4-dimensions of "spacetime" caused factors. Intelligence correlates with the 4th dimension  $\frac{3}{4}$  Time. The past 4 decades of research on intelligence has confirmed that Mental Speed is the principal biological component of intelligence (Eysenck 1997, Jensen 1998). Speed correlates with time. The explanation of an enormous mystery was revealed. What I realized, is that since the most phenomenal thing about spacetime is that it is curved as Einstein discovered, and since spacetime causes psychometry space, that psychometry space must be curved also and that this curvature would appear as a "higher order factor" in psychometry. Cattell's 1975 paper had even predicted such a factor. Knowing as I did by then that the phenomena of brain growth probably explained this factor, I immediately realized that this final, lone, *gravitational factor* was probably "God"  $\frac{3}{4}$  the classical God of history. The fact that all of Psychology ends in a single axiomatic physics factor, namely Gravity, is a powerful clue! In the next section we establish that brain growth is the direct biological cause of this final factor.

#### **IV The identification of the Secular Trend as the direct biological cause of God.**

Besides the simple factors we extracted from the correlation matrix, there are also "higher order factors". This is due to something called *Simple Structure*. We would expect 200 random words to form a spherical cloud in psychometry space. They do not, actually they form distinct bands or streaks. Long ago, Louis Thurstone the discoverer of Multiple Factor Analysis suggested that the factors, that is the eigenvectors, should be "rotated" to the center of these streaks to give a more meaningful interpretation of the axes (Thurstone 1947). Dubbed "Rotation to Simple Structure" this quickly proved physically meaningful. Today desktop computers utilizing commercial statistical programs perform thousands of these rotations automatically every day in factor analytic research, not only in Psychometry but in dozens of other Natural Science fields. The consequence of rotation is that the eigenvectors, or factors, are no longer orthogonal or "independent" of one another. This points to the existence of some higher order cause mutually influencing all 4 factors, causing them to correlate. Because of rotation to oblique, or *curved* structure, there is now a  $4 \times 4$  matrix, which like the original  $200 \times 200$  matrix, can be factored all over again to extract a new "higher order" eigenvector. In Physics, curvature of the 4 spacetime axes is the cause of Gravity. In

psychometry, curvature of the 4 psychometry space axes is the cause of "God", as we shall see in the sequel.

As I stated above, Cattell never factored his 1975 experimental 4x4 3rd order matrix to the 4th order [1]. However, having found a theoretical explanation of the 4th order factor, I sent Cattell's 4x4 correlation matrix to Drs. Paul Barrett and David Routh in England. They factored the matrix using an SPXX computer program. Sure enough, the 4th order factor appeared. The existence of God has been experimentally confirmed!

Now, factor analysis only discovers factors it does not tell us what is causing them. In this case however the direct biological cause is not hard to find. The cause turns out to be something called the *Secular Trend* in human growth. The Secular Trend is the name given to a now well known biological discovery made over 75 years ago, that Man is not fully grown (Tanner 1981, Dasgupta and Hauspie 2001). In fact, it was discovered that Man is becoming more fully grown with each passing generation. This effect is not genetic, it is due to the rising world standard of living, particularly nutrition. At first it was noticed in increasing height. It is frequently remarked that modern Man is so much taller than his ancestors that practically no modern soldier can fit into a Medieval suit of armor. So dramatic and well established is the literature on this subject that a report on the Secular Trend has even made the front cover of Time Magazine (Steckel 1996). Since the entire human body is growing larger, the brain is also getting larger, and this contributes to a rising level of world intelligence (IQ) known as the Flynn Effect (Jensen 1998, 325, 318). Intelligence is apparently rising at the rate of 3 IQ points per decade while height is currently rising several inches per century. Obviously this can't continue forever and it is generally recognized that this is a sigmoidal or S-Curve that eventually will level off at 100% growth. At that point Man will have reached his full theoretical (or genotypic) size. Apparently, this final eventuality will occur thousands of years in the future.

Meanwhile, the origin of this human growth deficit which the Secular Trend is slowly reducing, can be graphically diagrammed on an individual human growth curve, Figure 1.

So there is a long term Secular Trend in human brain growth and it increases intelligence. That intelligence increases with brain growth is witnessed by human intelligence increasing from 0 at conception to maximum at age 18; the principal cause being the growth of the brain from 0 to 3 pounds. Because of this, intelligence is divided by age (up to age 18) to determine IQ or intrinsic (genetic) intelligence. Although it is normally taken for granted, it is important to underscore here that intelligence is a direct function of brain growth.

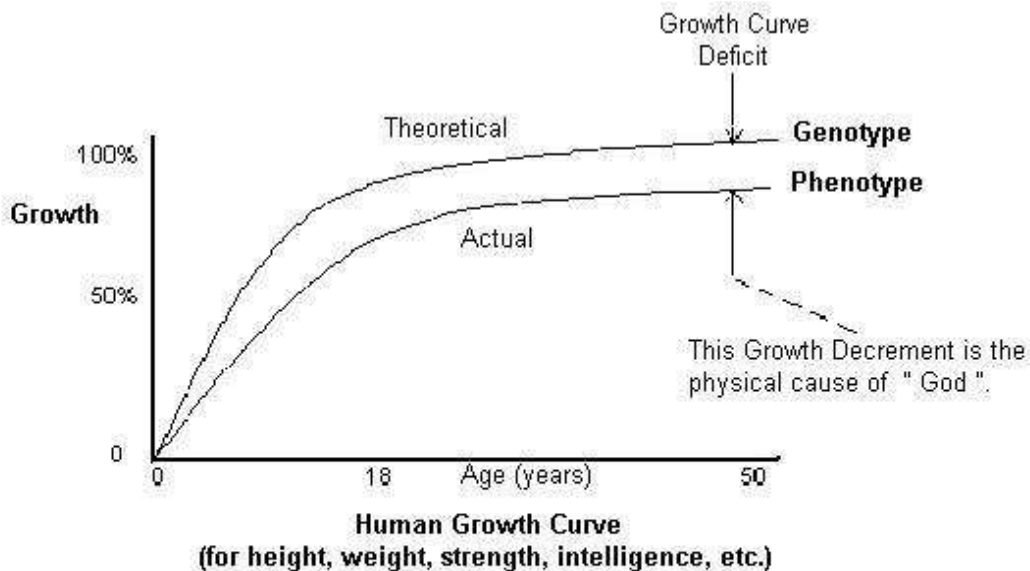


Figure 1 The Growth Curve Deficit. If the phenotype was fully grown (genotypic size) then there would be no further room to grow and hence no such thing as a Secular Trend in human growth. Hence the existence of the Secular Trend proves the universal existence of the Growth Curve Deficit shown above.

The simple fact that intelligence from the 3rd order loads on the single 4th order factor (Cattell 1975), and as we have just pointed out intelligence is nominally proportional to brain growth, is what securely identifies the biological cause of the 4th order factor as brain growth. As we shall see, while this growth affects intelligence at the 2nd and 3rd order (and E,N,P as well), it has a singular effect on mental perception at the 4th order. At the 4th order, brain growth determines the *percentage of reality* (size and speed of the world) that a person can actually see; and therein lies the explanation of why this factor is identified as "God". The proof of this subjective phenomena is more completely addressed in Section VI. In the meantime, we return to the identification of Gravity as the ultimate physical cause of this 4th order factor.

## V Mathematical evidence that gravity is the ultimate physical cause of God.

The theoretical significance of a connection between Gravity and God cannot be overstated. First<sup>3/4</sup> since gravity is real, God is real. Secondly, tradition tells us that God is "supernatural" and we find that Relativity explains the supernatural aspect of God. Relativity is the only physical phenomena which causes a "supernatural" effect on reality; reality being space and time itself.

Now, the first thing we have to do in this section is clarify a fundamental issue, and that is, how and why; real space causes psychometry space. The explanation is this. Ordinary space of common experience is Euclidean

(Cartesian). This means that the Pythagorean Theorem holds:  $r^2 = x^2 + y^2 + z^2$

This is the quadratic equation of a circle or a sphere. Because of this, Euclidean space is known as the space of "rigid body rotations". With any other metrical law we would not be able to rotate a rigid body in space without rupturing it, we could not even turn our heads. Herman Helmholtz (1868), Bernhard Riemann (1854), Herman Weyl (1918) and others discovered this long ago. This fact causes Nature to impress a quadratic metric on the real world, meaning that spacetime must have a metric which is Euclidean in 3 dimensional space.

Having ascertained that, it is also known that there are only a few "simple" coordinate systems in Euclidean space: Cartesian, Polar, Cylindrical and Spherical. Further, Mechanics teaches us that "simple machines" are nothing but mechanical realizations of these elementary coordinate systems. A brick is

Cartesian, a wheel is Polar, a screw is Cylindrical, a ball bearing is Spherical. But, of all the simple machines the Cartesian is by far the simplest and most common. It is for this reason, that Nature uses the *Cartesian Body Plan* for all

(multicellular) plants and animals including Man. The vertebrate skeleton is 3Axis Cartesian (Owen 1848). The human body is a Cartesian Machine and this causes the human brain to be 3-axis Cartesian, which in turn causes psychometry to be 3-axis Cartesian (see Hammond 1994 for details). Hence, it is the geometry of real space that causes the geometry of psychometry space, and from this we see that for the same reason a curvature of real space can cause a curvature of psychometry space. Since we identify the curvature in psychometry space as God, and we know the curvature in real space is Gravity, we conclude that gravity causes God; at least as far as Physics is concerned.

The next step is to discover specifically what gravity variable is causing God. Is it the force of gravity, the potential, the curvature or exactly what? It turns out there is a simple way to discover this. We can compare the metric of psychometry space to the metric of real space. Since the metric of real space contains gravity explicitly, we will find out what the relation between gravity and psychometry is. To do this, we compare two famous equations, one from Psychometry and one from Relativity.

First we recall that mathematically it is always possible to split an oblique matrix (the 4'4 metric in this case) into the sum of a diagonal matrix plus a smaller oblique matrix. This fact underlies both of the following equations. Physically, the interpretation of this is that the diagonal matrix represents an undisturbed orthogonal coordinate system, and the second smaller oblique matrix describes the physical influence (eigenvector/factor) that is causing this orthogonal coordinate system to become oblique.

The first equation then, is Thurstone's classical decomposition of a

correlation matrix into Specific and Common (or higher order) factors. This is the fundamental equation of Factor Analysis and is well known (Thurstone 1947, 81 Fig. 8). In this correlation matrix the 4 metrical dimensions are taken to be E,N,P and g:

$$\begin{array}{c}
 \mathbf{E} \quad \mathbf{N} \quad \mathbf{P} \quad \mathbf{g} \\
 \left[ \begin{array}{cccc}
 1+h_{11}^2 & & & (r_{1j}) \\
 & 1+h_{22}^2 & & \\
 & & 1+h_{33}^2 & \\
 & & & 1+h_{44}^2
 \end{array} \right] = \left[ \begin{array}{cccc}
 1 & & & \\
 & 1 & & \\
 & & 1 & \\
 & & & 1
 \end{array} \right] + \left[ \begin{array}{cccc}
 h_{11}^2 & & & (r_{1j}) \\
 & h_{22}^2 & & \\
 & & h_{33}^2 & \\
 & & & h_{44}^2
 \end{array} \right] \\
 \text{Covariance matrix} = \text{Specific matrix} + \text{Factor matrix}
 \end{array}$$

Fig. 4

2

Psychometrists will notice that I have added an additional  $[h_{ii}^2]$  matrix, to each side of Thurstone's original equation. This is simply a coordinate (scale) change which removes the statistical normalization ("z-scoring") from the correlation matrix on the left and converts it to a covariance matrix. It is still the metric of the space. The intent is to shift the unity normalization from the original correlation matrix on the left to the Specific matrix on the right thus making Thurstone's equation directly comparable to Einstein's equation which is presented next. Note that all 6 off diagonal elements are abbreviated with a single  $(r_{ij})$  to simplify the notation.

The second equation is Einstein's linearized version of the spacetime metric (Einstein [1922] 1996, 86). This expansion was first used in his original 1915 paper and is the fundamental equation of what is known as "linearized gravity" in Relativity (Misner et al. 1973, Ch. 18). In this case the 4 metrical dimensions are X,Y,Z and t, the 4 dimensions of spacetime:

$$\begin{array}{c}
 \mathbf{X} \quad \mathbf{Y} \quad \mathbf{Z} \quad \mathbf{t} \\
 \left[ \begin{array}{cccc}
 1+a & & & (g_{ij}) \\
 & 1+b & & \\
 & & 1+c & \\
 & & & -1-d
 \end{array} \right] = \left[ \begin{array}{cccc}
 1 & & & \\
 & 1 & & \\
 & & 1 & \\
 & & & -1
 \end{array} \right] + \left[ \begin{array}{cccc}
 2\Phi & & & (g_{ij}) \\
 & 2\Phi & & \\
 & & 2\Phi & \\
 & & & -2\Phi
 \end{array} \right] \\
 \text{Linearized metric} = \text{Lorentz metric} + \text{Gravitational terms}
 \end{array}$$

Eqn. 5

The point of comparing these two equations is that they each represent the

4<sup>4</sup> metric of their respective spaces; psychometry space and real space. Since we have just demonstrated that real space causes psychometry space, the second equation must physically cause the first. Comparing these two equations we see that they are the same if we equate  $2\Phi$  in Einstein's equation with  $h_{ii}$  in Thurstone's equation. This is the explicit mathematical relation between Gravity and Psychometry that we are looking for.  $\Phi$  as we know from Physics is the (Newtonian) gravitational potential. However, because Einstein's metric contains exact quantities, and Thurstone's statistical quantities, we find that actually we have the case  $h_{ii}=\Phi$ . This is because statistical variables add as the root mean square whereas exact quantities add arithmetically. Adding 2 standard deviations, 1 and h, does not yield (1+h) but actually  $\sqrt{1^2 + h^2} \gg (1+1/2 h)$ ; to first order. Therefore we see physically that h corresponds to  $\Phi$ , or  $h_{ii}=\Phi$ . Further however, the magnitude of  $h_{44}$  which is the "communality" of the 4th psychometry dimension, g or Mental Speed, is proportional to the standard deviation of brain growth from the population mean M. This is in accord with the established fact that intelligence is proportional to brain growth. However, since time, the 44-element of Einstein's equation correlates negatively with speed (speed=time<sup>-1</sup>), we see that  $\Phi$  is actually an increase in the brain growth deficit (1-M) thus identifying  $\Phi$  with "God" as shown in Figure 1. Thus we have formally established that God is identified with the gravitational potential. Incidentally it is hardly necessary to appeal to mathematics to see this. The elements in Einstein's metric are well known to be the "gravitational potential" and thus by simple inspection we see that the psychometry variables must depend on the potential  $\Phi$ .

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(4) "Communality" ( $h_{ij}$ ), means the projection of the vectors on the (common) higher order Factor; in this case the brain growth deficit. The magnitude of the latter is proportional to the standard deviation of brain growth from the population mean M, hence so to is the magnitude of the  $h_{ij}$ .

However there is more to the story. The gravitational potential appears merely as the communality or projection of the ENPg vectors on the higher order factor, it is not the higher order factor itself. There must be some other Relativity variable which is actually the higher order factor and which we can identify as the "physical cause of God". This factor must be a function of the metric so that  $\Phi$  will correlate with it, and it must be caused by brain growth since brain growth is the cause of God. It turns out that there is little difficulty in identifying this variable as  $G_{uv}$ , the Einsteinian curvature. The reason it is curvature that corresponds to brain growth is that the central equation of Relativity, Einstein's Field Equation, says that Curvature=G=T, where T is the mass density or "source term". This source term in psychometry space must of course be the brain growth deficit [3], since as we

have shown the brain growth deficit is the source term for God (cf. Figure 1). Since T is equated to the curvature by Einstein, and since the curvature is exclusively a function of the metric, this tells us that G, the gravitational spacetime curvature, is in fact the identity of the higher order factor. Hence we may write:

Eqn. 6 **God = G<sub>uv</sub>**

What we have arrived at is that God is mathematically described by the Einstein Curvature Tensor of General Relativity. What this result says then, is that when we look at a person and take note of his degree of growth, we are looking at the time and space dilations of his *World*. While this is all too familiar to parents who are used to observing children, who have very large natural growth deficits, the Secular Trend says there is a terminal growth deficit in all adults. We see now, how it is that Gamow's world actually describes the real world, and why each one of us is dramatically "seeing relativity" in everyday life.

Now, it is the Field Equation that tells us to put  $2\Phi$  in Einstein's linearized metric, and it is this metric that tells us there is a space and time dilation. The space and time dilations define a person's reality, or world. Equation 5 yields the well known formulas for these dilations (Misner et al. 1973, p. 445 eqn.

18.15c):

Eqns. 7- a,b,c

Spacetime Distance <sup>2</sup>	$= ds^2 = (1 - 2\Phi)(dx^2 + dy^2 + dz^2) - (1 + 2\Phi)dt^2 \equiv dL^2 - dT^2$
Time Dilation	$\equiv dt/dT = 1/\sqrt{1+2\Phi} \approx 1 - \Phi$
Space Contraction	$\equiv dR/dL = \frac{\sqrt{dx^2 + dy^2 + dz^2}}{dL} = 1/\sqrt{1-2\Phi} \approx 1 + \Phi$

But, from our analysis above  $\Phi=h_{44}$ , the dilation in Mental Speed. Equation 5 also shows  $\Phi=h_{11}=h_{22}=h_{33}$ , the dilation in E, N and P<sup>6</sup>. Thus we see that Mental Speed change (or intelligence change) due to brain growth is actually a relativistic time dilation, and also that the changes in personality due to brain growth are accompanied by a gravitational space contraction, a "spatial magnification" of reality. Both of these facts are in accord with the common observation that more fully grown people are larger and faster and hence see a smaller and slower world, or per contra, less fully grown people are smaller and slower and see a larger and faster world. In particular, the Secular Trend says none of us are fully grown, therefore the World looks larger and faster to

*everybody* than it actually is. This difference (and its variability) between actual reality and visible reality, is the explanation of what we call "God". These then are the immediate Relativistic laws by which God governs human reality, by dictating the size and speed of the world, or the *percentage* of the world that each individual is permitted to see. Since this is an absolute governance of human reality, we say that God rules the World.

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(5) Note that the word "God" used throughout this paper refers to the percentage of the brain which is ungrown. Thus "God" refers to the traditional "invisible God" of Heaven in Theology. The balance of God, the grown part of the brain, is God incarnate, or Man on Earth. Thus God historically descending from Heaven to Earth, or even a miracle, is a theological description of brain growth.

(6) In the Lorentz Gauge the dilations are equal. As psychometrists know, the communalities of ENP and  $g$  will seldom be equal. This simply means that brain growth (and hence  $F$ ) although linear in ENP $g$ , is not isotropic, presumably because of asymmetric brain growth, and that Factor space coordinates ( $z$ -scored) are not actually Lorentz Gauge coordinates. This does not qualitatively affect the scientific arguments presented here.

(7)

Finally, physicists will recognize this Section as merely an elementary outline of Relativity. The only thing new here is that Psychometry has been *causally equated* to Relativity. XYZt is equated to ENP $g$ . Mass density is equated to the brain growth deficit, and the conclusion is that God is caused by Gravity [1, 2]. In other words, the structure of Psychometry is *physically caused* by the structure of Relativity. Of course we have only demonstrated this to first order (Factor Analysis=Linearized Gravity), however in traditional perturbation theory fashion we presume that it holds exactly. Psychometry incidentally is well known to be nonlinear (Thurstone 1947, 322). Hence there is little question of the correctness of the mathematics. There is only the *causal connection* between spacetime and Psychology space to be established. This paper simply amounts to a rational scientific demonstration of that long suspected connection; via Cartesian brain cleavage and the Secular Trend.

Now, we have yet to identify the source of *this gravity that is apparently mediating brain growth*. It can't be terrestrial gravity because that has been constant for millions of years while the Secular Trend varies noticeably in a century. In fact it is generally agreed that the Secular Trend is a standard sigmoidal S-curve climbing toward a 100% plateau. We anticipate that this curve describes how Man is making progress towards "kingdom come" with ever increasing growth moving him towards 100% growth, or the (divine) state of bodily perfection. The Secular Trend is a biological index of

"Human Progress" as it were. Incidentally this fact has already been discovered by modern Auxology where the Secular Trend is often referred to as the "biological standard of living" (Komlos 1993, 115-144). Now apparently, we might call it the "divine standard of living".

Unexpectedly, an explanation of where this gravity might be has come from another direction. Sir Roger Penrose, in a celebrated thesis (Penrose 1994) has advanced the theory that Quantum Gravity, specifically gravitational curvature in the brain, ultimately controls brain processes. Currently this is the subject of large scale research in connection with Stuart Hameroff's experimental work on microtubule structure in the quantum basis of consciousness (Hameroff and Penrose 1998, Penrose 1994). It can be seen that the present result from Psychometry appears to be an experimental confirmation of Penrose's brain gravity hypothesis, a totally unexpected experimental turn of events.

Now, Factor Analysis only identifies variables. In that sense it is similar to Dimensional Analysis. Turbulence in hydrodynamics is an intractable problem, but simple dimensional analysis produces the Reynolds Number which can predict turbulence. Similarly, Factor Analysis identifies gravitational curvature as the cause of psychometric curvature. Of course it does not tell us *how* anymore than the Reynolds number explains turbulence. While it is obvious that the only *existing* candidate for the gravitational curvature is Penrose's brain gravity, it is certainly beyond my expertise to propose a model of how curvature induced "*collapse of the wavefunction*" in the brain manifests itself as macroscopic curvature. However, I do not underestimate the resourcefulness of our theorists in eventually constructing a plausible model. Apparently Penrose's mechanism mediates brain growth in an adaptive feedback loop between the external environment and mental response. Growth in this or that brain lobe is mediated by quantum gravitational curvatures in many billions of quantum brain processes. Apparently, there results a macroscopic curvature in brain growth, representing the cumulative statistical sum of these quantum curvatures. Certainly it will be interesting to see what models of this eventually appear. It is remarkable that the discovery of psychometric curvature is one of the first observations of quantum gravitational curvature. As Sir Roger Penrose apparently suspected, the human brain is currently the only device that can detect quantum gravity!

At this point we must move on to the next section which will show using elementary evidence, why it is that we can be absolutely confident that brain growth is the explanation of what has been called "God" for 3,500 years.

## **VI Elementary science evidence that the 4th order factor is "Gld".**

Jesus of Nazareth described God as "Our Father, which art in Heaven", and

said "Thy kingdom come. Thy will be done in earth, as it is in heaven." (Matt. 6:9-10 KJV). In fact, the World's most common description of God is an invisible man who rules the World. Clearly, the theory presented here provides a compelling scientific description of exactly such a God. It explains why He is invisible since the Growth Deficit is the invisible portion of Man, hence an invisible man. The growth deficit causes Heaven and a zero deficit is Eternal Life. Christ had a zero growth deficit hence was the "incarnation" of God. The brain growth deficit controls reality hence God rules the world. The end of the Secular Trend is "kingdom come". A sudden lifting of repression releasing pent up brain growth can effect a sudden and miraculous change in reality, hence a miracle. The Cross of Christianity is the Cartesian coordinate system. A hierarchy of factors explains God and demigods, hence explains both polytheism and monotheism. Given all this, there is little room for doubt that this result scientifically explains the Bible and the classical God of history. We need not even mention the flood of publications in the last 75 years by fiction writers and even scientists predicting a relation between God and Relativity. Obviously they were right. Using this scientific result then, we will now present a formal scientific explanation of God and Religion. It is the credibility of this endeavor which ultimately convinces us that what has been discovered is indeed, "God".

Man's greatest challenge is civilization itself. Of particular concern is human conflict. In this regard, the question of human dominance surfaces. Some people are strong and others weak. That is not judged a problem as long as there no such thing as corruption, or Evil so called. But, as the record shows Evil has played a substantial part in world history to everyone's disappointment. Amidst all this is a religious theory which says that Evil can be overcome by God and faith. Here, we will attempt to provide the scientific explanation of this historical tradition. First, consider the 3 faces shown in Figure 2.

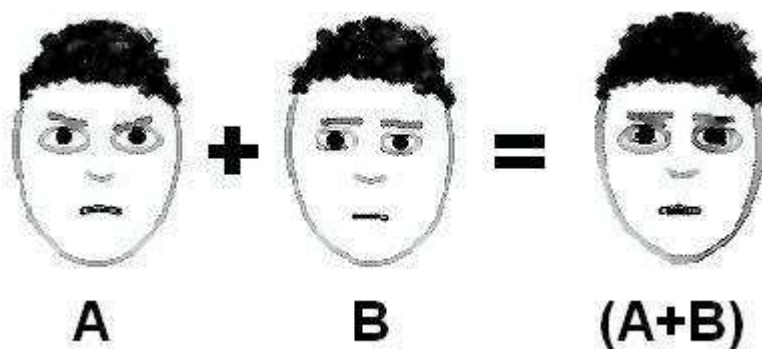


Fig.2 C is a composite face constructed by superimposing faces A and B.

A and B are identical twins raised in vastly different circumstances and this has produced a different personality for each. We notice A seems more

alert and stronger than B, he manifests a smaller growth deficit. However, due to the vicissitudes of personality development, in this case person A happens to appear menacing possibly even a bit dangerous. Person B on the other hand appears indifferent but at least not troublesome. Face C, is a computer superposition of faces A and B. Face C, perhaps an average person, manifests a potential range of appearance extending in this case all the way from face A to face B. Now, what I advance is this simple deduction; that when the public looks at person C, no one sees the same person. What person they see depends on their own personal growth curve deficit. For instance, a high growth person looking at C, will see face B whereas a low growth person will see A. This simply because there is a significant growth difference between A and B. As a result, highly developed beholders consider C to be harmless but poorly developed beholders consider C to be menacing. And therein I submit, lies the key to the central *historical drama* of God. Of course people with high development also see automobile traffic move more slowly (mental speed), but that is of small social significance compared to the different face of humanity they see. This phenomenal, indeed supernatural fact, leads us to the explanation of the epic miracles of Religion.

According to the Freudian theory of Repression normal brain growth can be repressed in the individual most commonly as the result of adverse social circumstances. Then, through some triggering psychological event this mental block can be broken allowing pent up brain growth to suddenly come on line causing a personality change. As is well known to Psychoanalysis, modern Psychotherapy is predicated upon the existence of exactly such a mechanism. In more dramatic (miraculous) cases the entire world can suddenly change. Not only will the traffic slow down, but notably, person C's appearance can suddenly switch from person A to person B right in front of the observer's eyes. If in fact person A was a dangerous adversary, seeing him transformed from person A to person B could well be a life saving miracle. In fact, many if not all of the miracles in the Bible refer to just such an event, only usually involving hundreds or thousands of people at once, mass miracles as it were. For instance, the famous "Parting of the Red Sea" is a metaphorical description of just such a miracle.

According to the Bible, the fleeing Israelites under Moses were subject to bondage in Egypt for 400 years. They had been growing stronger for generations but had to repress this in order to avoid persecution. Finally they were making their escape and in pursuit were thousands of soldiers all of whom must have looked like person A. Whirling swords over their heads and galloping forward in chariots with their menacing visages they must have been a terrifying spectacle to the Israelites. Suddenly, the prospect of freedom and escape overwhelmed Israel and this psychological trigger unleashed a lifetime of pent up brain growth and a miracle occurred. Looking back at the infantry, suddenly the face of the enemy changed from A

to B. The pursued became suddenly unafraid of their pursuers. Strengthened and heartened *e n masse* by this miracle they immediately rallied, outflanked the Egyptians and escaped across the Red Sea (apparently at low tide). Israel was saved by a miracle. Ever since, this supernatural miracle of God has been euphemistically reported as the "Parting of the Red Sea", simply because the actual event has been heretofore too sophisticated and incredible for Science to explain.

Every epic miracle in the Bible is an example of this. They are metaphors describing the supernatural ascension of the perceptual power of the underdog allowing him to miraculously overpower a seemingly invincible oppressor. In other cases, it can be a metaphor to the demographic disaster than can overwhelm a nation under corrupt leadership. A plague of frogs or locusts is a metaphor to the appearance of hosts of troublesome psychological types, such as person A, who are oftentimes characterized as frogs or locusts because of their pugnacious or destructive behavior. Moses warned the Pharaoh that the bondage of Israel would incite hordes of terrorists and hooligans in the Egyptian ranks who would plague Egypt and destroy the society. Such a thing was certainly seen in Europe under a dictatorship. On the other hand, there are cases of brain development's salvatory power on health. Faith healing is a case of mental block busting unleashing latent brain growth empowering a person's body directly. Jesus knew this and could spot people who were suffering from this condition and could by his commanding presence alone break the mental block and lift repression, causing miraculous cures of hysterical illness and even overpowering real organic disease. Clearly people can be miraculously saved by God. On a larger scale, the majority of humanity benefits from simple religious services in this regard.

We now turn to something less daunting, and that is a demonstration of how this theory explains the 4,500 year chronology of Religion. First we return to Psychometry and point out that the full map of Psychometry shows a hierarchy consisting of 30-1st , 13-2nd , 4-3rd , and 1-4th order factors (Cattell 1973). Each of these *orders* of factors may be interpreted as a personality description, and the higher the order, the more expansive the description. For this reason we can identify the various demigods and gods in the history of Religion with these factors or personality types, for instance:

- 30-1st order factors = 30 demigods of the Hindu and ancient religions
- 13-2nd order factors = 13 Olympian gods of the Greco-Roman Pantheon
- 4-3rd order factors = 4 Gospel Saints of Christianity: Mt, Mk, Lk, Jn
- 1-4th order factor = The God of Monotheism: God, Allah, Yahweh, Brahma, Buddha, etc.

We see the entire history of Religion explained as the discovery of successively higher orders in the factor hierarchy. With the advent of Christianity and the Cross, even the Cartesian Structure itself was discovered since the Cross is simply the Cartesian coordinate system<sup>7</sup>. Ancient polytheism only succeeded in discovering the 1st and 2nd orders. Akhnaten and Moses finally discovered the single 4th order factor, the God of monotheism. Interestingly, while Islam and Judaism redact all but the single 4th order factor, Christianity retains the 4-3rd orders as the 4-Gospel Canon. Hinduism on the other hand, developing independently of Western Religion, retains to this day all 4-orders of factors. Totaling the list above accounts for 48 gods and demigods. Of course, since Hinduism recognizes a supreme deity in the Trinity of *Vishnu, Krishna, and Brahma*, this becomes the 4th order factor and Hinduism is monotheistic despite its many "gods"<sup>8</sup>.

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(7) The ancient Egyptian *Ankh* apparently prefigures this discovery by 2,000 years.

(8) According to my research, the Trinity refers not to the Structural Model but the dynamical model, namely the trinary feedback loop of "input, output and feedback", being the "Father, Son and Holy Ghost". It is my conclusion that while the Structural Model explains the Bicameral/2-Party System, the Trinity explains the 3-Branches of Government.

Another example of the comprehensive explanatory power of this discovery involves "Creation". Reality is controlled by the human brain, since brain growth changes reality. The modern human brain is only about 40,000 years old which is when *Homo Sapiens sapiens* first appeared. This means that reality "as we know it" did not exist prior to 40,000 years ago. Certainly in the scientific sense of this theory, it is correct to say that the entire world, billion year old fossils and all, was created" approximately 40,000 years ago. This then, is the Creation described in Genesis. While Evolution is certainly correct, so is Creationism, or the Biblical account of Creation. Adam and Eve were simply the first two *Homo Sapiens sapiens*. Genesis is not a myth or a legend, it is a historical record of the birth of reality, or the World, as Man witnessed it 40,000 years ago. Archbishop Ussher put it at 6,000 years ago, but certainly 40,000 years is near agreement on a scale of 15 billion years which is the accepted Evolutionary age of the Universe.

Another point often cited by philosophers, is the objection as to how Science can prove God if God created Science? Classical Physics holds that there is an absolute reality and that Man produces a 1:1 map or picture of this using his sensory apparatus and brain. We have now discovered that this map is not 1:1 but because of the Secular Trend is perhaps for instance .85:1.

Since Man naturally presumes a 1:1 relationship; it is the variability of this ratio which explains "supernatural" occurrences in reality thus explaining the time honored historical description of God.

Having now proven this to two decimal point accuracy, we may answer the pedant by simply asserting that God has *provided* us with a scientific proof of his existence.

Science and Religion are reconciled by this discovery. Mass, length and time are defined by human intuition. Physics can only discover the *Laws* of mass, length and time. Science can say that gravity causes God because it modulates human perception, and yet Theology is correct in saying that God ultimately being this perception itself, creates reality including gravity, the world and everything in it. According to this theory both viewpoints are correct.

Finally there is the matter of Eternal Life. This discovery indicates that there is such a thing as Eternal Life. Clearly, the state of zero growth deficit corresponds to a state of eternal life. We see that "eternal time" refers to undilated time, not infinite time. Living "forever" means living in undilated time or *real time*, not living for billions of years. When the brain growth deficit goes to zero at "kingdom come" sometime in the future, the 4th order factor goes to zero and psychometric space becomes "flat". Physics would say the brain has become fully grown. Psychology would say the Unconscious Mind has become conscious, and Theology would say that God has descended from Heaven to Earth. Fully grown Man is the "incarnation of God". Christian tradition therefore has it correctly (nominally) that Jesus was the bodily incarnation of God for instance. When the 4th order factor goes to zero there is no gravitational time dilation and Man is in real time, or true reality. Undilated time has the subjective property of being "eternal", because fully grown Man is physically perfect and sees a perfect world (sees actual reality). This is because the only thing fundamentally imperfect about Life to begin with, is in fact the existence of the human growth curve deficit.

None of us will live to see Kingdom Come which is the end of the Secular Trend. This has raised the speculation that there may be Life After Death. This conjecture holds that there is a phenomena of death in which the Unconscious Mind becomes conscious and eternal life is realized in a spiritual world. It is said that we "go to Heaven". Interestingly, the present theory makes the conjecture more rational since death could involve a relativistic time dilation expanding the last moment of life into years. Life after death then would actually be life before death, which only relativistically *appears* to extend beyond death. However, this discovery contains no new information about death. Moreover, it depends on Brain Science and Gravity and the complete theory of neither is known. So Life After Death remains a mystery, despite the fact that we have explained what Eternal Life is and have even deduced that Man will achieve eternal life on

Earth someday.

One thing is certain however, the discovery that  $\text{God}=\text{G}_{\text{uv}}$  is now the point of departure for future research. The most "supernatural" thing known about  $\text{G}_{\text{uv}}$  is that it contains a singularity which produces a Black Hole with an infinite time dilation and an Event Horizon. If  $\text{G}_{\text{uv}}$  causes a psychometric factor as we have just discovered, then there could be an Event Horizon or even a Black Hole in *perceptual reality*. According to this the event horizon is the borderline between the grown and ungrown brain, separating Heaven and Earth as it were. Thus we are actually looking at this event horizon every day.

Future efforts, building on the discovery reported here will take us into modern gravity research. The division of the brain into grown and ungrown parts divides information about the perceptual world into invisible and visible portions (Heaven and Earth). Jacob Bekenstein and Stephen Hawking have discovered that this division of information, or entropy, is characteristic of an event horizon and obeys the Second Law of Thermodynamics (see Smolin 2001). Apparently we might speak of the entropy of Heaven and Earth as obeying the second law of thermodynamics. If there is such a thing as life after death then this phenomenology must be linked to it; perhaps one can (spiritually) cross this event horizon into another world. According to the second law, what we would see there is the information missing from our perceptual world. Of particular interest is the question of whether the second law might yield an *existence theorem* for life after death? Unfortunately, given the state of knowledge in this area presently one cannot even hazard a credible guess as to the scientific likelihood of such a thing. Science simply does not know.

Summing up, it appears that future research should proceed on the assumption that all of the phenomena of classical Relativity may be present in perceptual reality, a Divine Action Principle corresponding to the Einstein-Hilbert Action Principle, an Event Horizon, even the possibility of a perceptual Black Hole caused by quantum gravity. Hopefully, we may one day fully complete George Gamow's prophetic inspiration concerning the existence of a "relativistic world".

## **VII The scientific proof of God has been discovered.**

The aim of this paper is to disseminate an important interdisciplinary discovery to as large a range of scientists as possible. Few scientists are expert in both Psychology and Physics. Experts in both fields will notice extensive simplifications of complex points in the interest of heuristic clarity. It is only hoped that this paper is sufficiently detailed for experts and at the same time clear enough for nonexperts so as to be able to convince both that a scientific explanation of God has actually been discovered.

This theory is not a speculation, it is a discovery. My 1994 paper clearly documents the path by which it was discovered. Allowing even that, the reader should pause to consider that the discovery of Curvature in real space already ranks as the most famous discovery in the history of Science. In view of Einstein's success, rejecting the proposition that God is a curvature of psychometry space without carefully weighing the evidence is presumptuous at best. There is certainly nothing in this thesis which is speculative, and in fact by modern scientific standards it is an elementary theory. Of course history teaches us that elementary theories are often the most sophisticated, with apparently the theory of God being superlative. Finally, the field of Psychometry is a century old and therefore the experimental basis of this theory is well established. The unification of the two great realms of Psychology, Intelligence and Personality, into a single psychometry metric is a remarkable result which is sure to stimulate much new research [4]. The discovery of the (3D-cubic) Structural Model of Personality is a prize currently sought by hundreds of scientists all of whom are apparently unaware of my 1994 paper. The experimental support of Penrose's brain gravity not only forecasts success in the search for a quantum gravity Noumenon, but also represents direct experimental support for the Hameroff-Penrose model of consciousness. Finally, an actual scientific proof of God has been detected. Surely it is time that the scientific community took note of these developments.

In conclusion, I would only say something about the significance of this discovery. The proposition that Psychology is Relativistic, if true, immediately elevates not only Psychology but even Theology to the status of hard axiomatic sciences. Beyond that; from Aristotle, Descartes and Newton down to the present day no one has ever questioned the significance of a scientific proof of God. Such a result would *de facto* effect an ecumenical unification of World Religion. Current events underscore the strain on civilization caused by the conflict of world religions.

One should mention the impact of this discovery on mental health. In my opinion a sense of the existence of a "higher power" is the mainstay of sanity. Young people, especially children are in strong possession of this since  $God = G_{uv} \gg \text{¥}$  at birth [3], but with growth and the stress of life this sense can become eroded. This is the symptomatic description of chronic mental disturbance. Normal perception according to this theory, includes a sense that there is an unknowable and supreme power. This provides not only optimism and hope but the *physical perception* of an unbounded future, even to the very old. A proof of God will therefore eventually improve the world's mental health.

Lastly, never before in history has Man known for sure that there is a God. If a scientific proof has actually been found, we have every reason to expect an immanent and miraculous advance in Civilization.

## Notes:

[1] ENPg are identified as the equivalents of XYZt. Actually this is a gloss avoiding details, but is essentially correct. The 4 metrical variables of Psychometry are nominally 3rd order factors while ENPg are actually 2nd order factors. Unknown to Cattell in 1975 however, the 2nd orders are cubically intercorrelated. The mathematical effect then of 3rd order factorization is simply to collapse the 10 oblique cubic factors onto the 3 normals, ENP. Theoretically, there really are no new 3rd order factors. The 4-3rd orders  $Q\alpha$ ,  $Q\beta$ ,  $Q\delta$ ,  $Q\epsilon_2$  are actually congruent broadened versions of the same *4-Principal Axes* of 2nd order space. Cattell's data confirms this congruence (Cattell 1975, Table 5, p.145; where Cattell's 1=QI=E, 2=QII=N and 4=QIV=P. See footnote 2). Note that the matrix in Table 5 is nearly diagonal in the upper left hand corner indicating that the largest 2nd order factors ENP are aligned with the largest 3rd order factors  $\alpha\beta\delta$ . Similarly, Cattell finds Intelligence QVII, to be aligned with the 4th -3rd order factor  $Q\epsilon_2$ , *ibid.* Table 6 column 2. This experimental result confirms the theoretical prediction that such must be the case. On this view then, God is actually a 3rd order factor and there are no 4th order factors.

There is a further complication associated with the 4 dimension, g. Cattell actually found 5 identifiable factors at the 3rd order, not 4. The 5th factor  $Q\gamma$  is aligned with Cattell's Corteria 3=QIII, *ibid.* Table 5, which I take to be a motor expressed "superior growth" speed (rapid reaction time, ideomotor speed, endurance, Cattell 1973, p.186), whereas, g or IQ is traditionally a sensory expressed "superior genetic" speed (theoretical/analytical decision speed). I assume then a total mental speed factor TMS, to lie near 45-degrees between  $Q\epsilon_2$  and  $Q\gamma$ . We note that TMS always loads positively on brain growth, while E,N and P may load either + or - during different social eras. Hence finally, there are only 4 factors at the 3rd order, not 5, and they are essentially ENP and (total) mental speed from the 2nd order.

Also to be mentioned is that mental speed; both g and Corteria (in fact all psychometric factors), contain both *Nature* and *Nurture* (genetic and growth) variance. Presumably the genetic variances do not correlate (are random) while of course the growth variances will all correlate with a "total growth" factor. Hence the higher order factor is a pure "growth factor", in this case the total overall brain growth deficit. Perhaps this is an appropriate place to mention that God therefore is apparently not genetic. In the first approximation at least, God is caused exclusively by Nurture and not Nature.

[2] The formula  $G=T$  does not tell us the distribution of T as a function of ENPg. This must be given independently, just as the distribution of  $\rho$  in

spacetime is. In Psychometry space this distribution is known since we know that Intelligence (psychometric-g) increases linearly with brain growth BG and hence decreases linearly with the brain growth deficit GD (note  $BG=1-GD$ ). Since  $G_{uv}=T_{uv}=\rho=GD/1-GD \gg GD$  (see note 3 below), this tells us that there is a linear gradient of curvature in psychometry space. Incidentally, since the Secular Trend says that GD is historically approaching zero, this means that psychological space will eventually become flat. This event is known in popular Psychology, as well as canonical Theology, as the "end of the World" and marks the successful end of Man's historic struggle to construct a perfect world (also referred to as "kingdom come").

Also of interest is the potential as a function of ENPg. In Factor Space the potential is linear in ENPg (since  $h_{ii}=\Phi$ ). Since the generalized "gravitational force" in Relativity is G which is proportional to the negative gradient of  $\Phi$  (the metric), we see that there is a constant "gravitational force" pointing in a specific direction in psychometry space. Presumably this represents psychological force perhaps public opinion or "social pressure" (e.g. the social force of God) and always tends towards increasing growth since (total) mental speed always loads positively on brain growth. Apparently this force, whose direction is reversible (in ENP space), serves to maintain the balance of the BI/2P System, as well as to move the population towards decreasing curvature, i.e. in the direction of increasing growth. Thus there is a "Divine Action Principle" which tends always to minimize the curvature similar to the well known Action Principle of General Relativity.

[3] Analysts may wonder how mass density  $\rho$  which runs from 0 to  $\infty$  can correspond to the brain growth deficit GD which runs from 0 to 1. The reason is trivial. We know that mental speed MS (i.e. intelligence) is proportional to braingrowth BG, as evidenced by the linear increase in intelligence for the first 18 years of life. Thus  $MS=BG=1-GD$ . However time T is the reciprocal of speed, thus  $T=1/BG=1/(1-GD)$  and the time dilation defined as  $T-1$  is  $T-1=GD/(1-GD)$ . The time dilation thus runs from  $0 \rightarrow \infty$  as the growth deficit GD runs from  $0 \rightarrow 1$ . From Linearized Relativity we know that  $T-1$  is the gravitational potential (Eqn. 7) which increases as the average mass density increases; in fact the time dilation becomes infinite when the mass density becomes infinite. Thus mass density  $\rho$  must also correspond asymptotically to the form  $\rho=GD/(1-GD)$ . Of course for small GD this is simply  $\rho \gg GD$  which prevails in Psychometry where GD is at least an order of magnitude less than 1. Incidentally, while linear analysis yields a reciprocal law, there is reason to believe that Fechner's Law (logarithmic law) probably applies so that  $\rho=-\ln(BG) =-\ln(1-GD)$  which of course would be experimentally (psychometrically) indistinguishable from a simple reciprocal

result.

[4] Relativists may notice that the signature of the metric has not been mentioned. Psychometry only measures the individual elements of the metric, it has not (as yet) measured the signature. While the Psychometry metric has long been presumed to be Euclidean in personality space (as it is in real space), the interaction of Intelligence and Personality is unknown. According to my result the Psychometry metric is actually Lorentzian in 4 dimensional space. Intelligence subtracts from Personality in the same way that time subtracts from space in Relativity. So far there is only qualitative evidence for this, such as the historical preeminence of the Bicameral/2-Party System which is believed to lie near the N-g plane in ENPg space. (see Hammond 1994) Distance in this plane would obey the (Lorentzian) 4-lobed Lemniscate of Bernoulli, well known to Relativity, and would thus explain the high definition and robust stability of the BI/2P System (i.e. "personality clash" in this plane is not isotropic but is in fact quadrupole). Confirming the Lorentzian signature of the Psychometry metric now has a high priority in future psychology research. This will involve the psychometric measurement of Personality Clash so called (psychometric proper distance). Coincident Roll Call voting statistics for the BI/2P legislature (U.S. Congress) would be a good starting point, they are available on magnetic tape. A Lorentzian metric should cause a distinct quadrupole silhouette in these graphs. In the meantime there is no evidence contrary to this Lorentzian prediction.

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