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Are *g* and the General Factor of Personality (GFP) correlated?

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ABSTRACT

We examined whether the General Factor of Personality (GFP) is related to the *g* factor of cognitive ability using data from the Vietnam Experience Study which randomly sampled 4462 Vietnam War veterans from a total sample of about five million Vietnam era army veterans. Exclusionary criteria included passing a fitness test, achieving a final rank of no higher than sergeant, and scoring above the 10th percentile on a pre-induction general aptitude test, but otherwise the sample is broadly representative of the U.S. male population for the period 1965–1971. A hierarchical confirmatory factor analysis of the Minnesota Multiphasic Personality Inventory (MMPI) and 15 cognitive ability tests yielded three first-order factors from the MMPI (Somatization, Internalization, and Externalization), and four first-order factors from the cognitive ability tests (Memory, Dexterity, Crystallized, and Fluid intelligence). At the apex of both measures was a general factor and we were able to fit a model which integrated both structures. This model provided a close fit to the data ($\chi^2 = 3114.1$, df = 235, RMSEA = .052, SRMR = .047, NNFI = .97), and provided an estimate of −.23 for the correlation between *g* and the GFP(Abnormal), that is, the higher the *g* score the higher the score on the GFP. One possible reason for the low correlation is restriction of range in the sample. Another is that intelligence and personality are to a degree mutually exclusive strategies, the first aimed at generating resources and the second at maximizing one's share of resources.

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1. Introduction

Hierarchical models of individual difference constructs are commonplace. Perhaps the most well researched and least controversial is the Cattell–Horn–Carroll taxonomy of human cognitive abilities. This is best conceived of as an organizing framework in which *g* sits at the apex of the hierarchy of specific cognitive abilities, of which there are probably four strata, and about 16 Stratum II factors (McGrew, 2009). More controversial has been the recent hypothesis that a similar construct, the General Factor of Personality (GFP), sits at the apex of the personality hierarchy (Musek, 2007; Rushton, Bons, & Hur, 2008; Rushton & Irwing, 2011). The current study seeks to explore the relationship between *g* and the GFP, and to offer a possible explanation of this relationship drawing on recent work in individual differences and behavioral ecology.

One framework for understanding the relationship between *g* and the GFP is Life History (LH) theory, which posits that clusters of correlated traits (e.g. timing of puberty, age at sexual debut and first birth and parental investment strategies) lie on a continuum from slow to fast. In the simplest form of LH, fast strategies are hypothesized to evolve in harsh and unpredictable environments, while the reverse holds for slow strategies. Originally LH was conceived of as a cross species phenomenon, but there is now considerable evidence of within species differences in LH strategies, in particular among humans (Ellis, Figueredo, Brumbach, & Schlomer, 2009). Rushton (1985) showed that the degree to which a person adopts a slow strategy co-selects for a range of characteristics including intelligence, altruism, being law abiding, behaviorally restrained, maturationally delayed and longer lived. Overall he predicted that diverse

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characteristics including personality characteristics would correlate together as a suite of characteristics genetically organized to meet the trials of life: survival, growth and reproduction. Thus LH theory predicts greater intelligence, both within and between species, mediated by brain size (Rushton, 2004). It also predicts a General Factor of Personality (GFP), for which there is substantial psychometric evidence (Rushton & Irwing, 2011).

Rushton et al. (2008) proposed that much like *g*, the GFP has clear positive and negative poles. High scores on the GFP indicate what is meant by someone having a "good" personality; low scores indicate what is meant by a "difficult" personality, i.e., someone who is hard to get along with. Individuals high on the GFP are altruistic, agreeable, relaxed, conscientious, sociable, and open, with high levels of well-being and self-esteem. These characteristics are hypothesized to have co-evolved alongside *g* as part of a slow Life History strategy. Further, Rushton et al. (2008) argue that, like the *g* factor, the GFP arose through evolutionary selection for socially desirable traits that facilitate performance across a wide range of contexts. This follows a proposal by Darwin (1871) that natural selection acted directionally to endow people with more cooperative and less contentious personalities than their archaic ancestors or nearest living relatives, the chimpanzees. Rushton et al. (2008) conjectured that individuals high on the GFP left more progeny, since people prefer as mates, fellow workers, and leaders those who are altruistic, conscientious, and emotionally stable. People able to cooperate in groups were also more likely to win competitions and wars.

There is growing psychometric support for the location of a GFP in a large number of personality inventories (Rushton & Irwing, 2011). The nonclinical inventories include the Big Five and Big Five alternatives, the California Psychological Inventory, the Comrey Personality Scales, the EAS Temperament Scales, the Eysenck Personality Questionnaire, the Guilford-Zimmerman Temperament Survey, the Hexaco Personality Inventory, the Hogan Personality Inventory, the Jackson Personality Inventory, the Multidimensional Personality Questionnaire, the Personality Research Form, the Temperament and Character Inventory, and the Trait Emotional Intelligence Questionnaire (Erdle, Irwing, Rushton, & Park, 2010; Figueredo, Vásquez, Brumbach, & Schneider, 2004; Loehlin & Martin, 2011; Musek, 2007; Rushton & Irwing, 2009a, 2009b, 2009c, 2009d; Rushton et al., 2008; Rushton et al., 2009; Schermer & Vernon, 2010; Veselka, Schermer, Petrides, & Vernon, 2009; Veselka et al., 2009; Zawadzki & Strelau, 2010).

The largest study to find a GFP comprised a sample of 628,640 Internet respondents who completed the Big Five Inventory (Erdle et al., 2010). One study found the GFP was independent of method variance using a multitrait-multimethod analysis of self-, teacher-, and parent-ratings of 391 13- to 14-year-olds on the Big Five Questionnaire—Children (Rushton et al., 2009). Several cross-national twin studies have found 50% of the variance on the GFP is attributable to genetic influence and 50% to nonshared environmental influence, including from 322 pairs of twins in the United Kingdom, 575 pairs of 2- to 9-year-old twins in South Korea, 651 pairs of 14- to 30-year-old twins in Japan, and 386 pairs of 18- to 74-year-old twins in Canada and the United States (Figueredo et al., 2004; Rushton et al., 2009, 2008; Veselka, Schermer, Petrides, Cherkas, et al., 2009; Veselka, Schermer, Petrides, & Vernon, 2009). The South Korean twin data showed that the GFP had emerged by 2- to 3-years of age (Rushton et al., 2008).

Inventories of the personality disorders also yield a GFP. Rushton and Irwing (2009c) found a general factor of maladjustment from the interscale correlations of the Minnesota Multiphasic Personality Inventory-2 ($N = 2600$) that explained 49% of the variance in two second-order factors dubbed Internalizing and Externalizing in a model that went from the GFP to two second-order factors, to four higher-order actors, and then to all 10 scales. Rushton and Irwing (2009d) extracted a GFP from the Millon Clinical Multiaxial Inventory-III ($N = 998$), which accounted for 41% of the variance in two second-order factors, again identified as Internalizing and Externalizing, 31% of the variance in five first order factors, and 26% of the variance in all 24 scales. Rushton and Irwing (2009d) also found a GFP in a cross-validation study of the Personality Assessment Inventory (Ns = 1246, 1000) that accounted for 65% of the variance in Internalizing and Externalizing, 47% of the variance in five first-order factors, and 27% of the variance in all 18 scales. Rushton, Irwing, and Booth (2010) found a GFP in three validation samples of the Dimensional Assessment of Personality Pathology—Basic Questionnaire (DAPP-BQ). In a general population sample ($N = 942$), the GFP explained 34% of the variance in four first-order factors and 33% of the variance in all 18 scales. In a twin sample ($N = 1346$), a GFP explained 35% of the variance in four first-order factors and 34% of the variance in all 18 scales. In a clinical sample ($N = 656$), a GFP explained 34% of the variance in four first-order factors and 30% of the variance in all 18 scales.

Despite the growing body of psychometric replications supporting the GFP, a number of criticisms have been raised within the literature. For example, the GFP has been variably argued to represent social desirability, halo or evaluation (Anusic, Schimmack, Pinkus, & Lockwood, 2009; Bäckström, 2007; Bäckström, Björklund, & Larsson, 2009; Saucier & Goldberg, 2001). Further, the predictive power of the GFP over and above the broad traits of the Five Factor Model has also been questioned (de Vries, 2011).

Much emphasis has also been placed on the results of multitrait-multimethod studies (MTMM) in establishing the substantive nature of the GFP. One of the underlying assumptions of MTMM is that correlations between traits on a single method can be biased by artifacts or method bias, whereas correlations across methods will be less susceptible to such effects (Eid, Lischetzke, Nussbeck, & Trierweiler, 2003). Therefore, if higher order factors of personality are the result of method bias and/or artifacts, theoretically they should not emerge from cross method correlation matrices. To date, five MTMM studies have provided evidence against the GFP (Anusic et al., 2009; Biesanz & West, 2004; DeYoung, 2006; McCrae et al., 2008; Riemann & Kandler, 2010), and two MTMM studies have reported positive support for a GFP (Rushton et al., 2009; Zawadzki & Strelau, 2010). Thus the evidence from MTMM studies of a GFP is somewhat inconclusive. Moreover, while it is generally concluded that failures of the GFP to emerge across raters are because it constitutes an artifact, there are other possible reasons. For example, there is considerable evidence for the situational specificity of human behavior (Bandura, 1997; Mischel & Shoda, 1995), and that these effects are strong (Malloy, Albright, Kenny, Agatstein, & Winquist, 1997). Paunonen and O'Neill (2010) argued on this basis for the superiority of self-report over peer ratings. It may be

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