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The general factor of personality and general intelligence: Evidence for substantial association

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ABSTRACT

Despite theoretical assertions derived from life history theory, research on the relationship between the general factor of personality and general intelligence has shown that there is little overlap between the two higher-order constructs. It is argued that the association between these general factors is largely attenuated by measurement error in assessing the general factor of personality. A substantial association between the general factors at multiple points in time was found when the general factor of personality was derived from rater Q-sorts. The results have important implications for the study of individual differences.

1. Introduction

The proposition of a general factor of personality (GFP), similar to the positive manifold or *g* found in measures of cognitive ability, offers a degree of unification across conceptualizations and measures of personality which would fundamentally change our understanding of human individual differences. A substantial association between the GFP and general intelligence (*g*) would suggest that the GFP is a meaningful construct and also has broader theoretical implications (e.g., Penke, Denissen, & Miller, 2007). It has been posited that both the GFP and *g* reflect differences in life history strategies. In essence life history strategies are reproductive strategies that manifest as developmental trajectories (e.g., Belsky, Steinberg, & Draper, 1991) and in an assortment of individual differences (Figueredo, Vásquez, Brumbach, & Schneider, 2004). It is thought that a single continuum defines differences in life history strategies with one pole labeled as fast and one pole as slow. Both individual differences in the GFP and *g* have been put forth as representative of individual differences in life history strategy with the GFP and *g* tracking the movement along the continuum from fast to slow. Following the logic that two variables that reflect the same latent construct must be correlated, if both the GFP and *g* are measures of life history strategy then they should be correlated.

To date eight studies have reported on thirteen correlations between the GFP and *g*. In a sample of Japanese twins, Rushton et al. (2009) found non-significant correlations between two GFPs based on self-report measures and IQ ($r = .03$ & $r = .11$). In two Canadian samples Schermer and Vernon (2010) found correlations of $r = .26$ and $r = .28$ between the GFP and *g*. Using the National Merit twin sample Loehlin (2011) found that a GFP constructed from the California Psychological Inventory correlated with scores on the National Merit Scholarship Qualifying Test at $r = .28$. Using a sample of United States veterans Irwing, Booth, Nyborg, and Rushton (2012) found that a negatively valenced GFP derived from subscales of the Minnesota Multiphasic Personality Inventory was negatively correlated with *g* at the magnitude of $r = -.23$. Schermer, Carswell, and Jackson (2012) found that in a sample of potential employees at a nuclear power plant the GFP and *g* correlation was $r = .01$ and in another study of job applicants, Schermer and MacDougall (2013) found a correlation of $r = .02$. Loehlin and Horn (2012) report four correlations between the GFP and *g*. Using data from the Texas Adoption Project they report correlations between GFP and *g* in adopted children, the child's adoptive mother and father, and the child's biological mother. For the children the correlation was $r = .16$, for the adoptive mother it was $r = .01$,

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for the adoptive father it was $r = .08$, and for the biological mother it was $r = .13$. Finally, Lesson, Heaven, and Ciarrochi (2012) found that general intelligence measured while the participants were in the seventh grade was negatively correlated with a GFP calculated when the participants were in the 12th grade at $r = -.12$. Based on these studies the unweighted correlation between the GFP and *g* is $r = .11$.

While the direction of the correlations are mostly positive, the overall magnitude is low seemingly disqualifying the suggestion that the individual differences on both the GFP and *g* emerge from the same source; differences in life history strategy. Indeed correlations between *g* and measures of life history strategy are also of low magnitude (Sefcek & Figueredo, 2010; Woodley, 2011). These findings have led to addendums to the more elegant original proposition that the GFP and *g* have a linear relationship tied to the life history continuum (e.g., Irwing et al., 2012; Woodley, 2011).

However, a key to the low correlations between the GFP and *g* could possibly be found in the argument that the GFP itself is largely measurement error similar to socially desirable responding (e.g., Bäckström, Björklund, & Larsson, 2009). If this is so then the intercorrelations between indices of lower-order variables that compose the GFP (e.g., the Big Five) should be inflated, however, in turn, this should dampen the strength of the association between the social desirability laden GFP and criterion variables that don't include error from social desirable responding. For example, Schermer and Vernon (2010) report significant positive correlations between the GFP and social desirability, but non-significant correlations between *g* and social desirability and increases in the association between the GFP and criterion variables when controlling for social desirable response bias have been found (Dunkel, Kim, & Papini, 2012). This could be a contributing factor in the low correlations between the GFP and *g*.

2. Rationale for the current investigation

The current investigation was an attempt to further test the relationship between the GFP and *g* using measures for GFP that should reduce error. This was achieved by using data from the Block and Block (2006) 30-year longitudinal study. Intelligence tests were administered to the participants in the sample at ages three, four, seven, 11, and 18. Personality was measured at each of these ages and at age 14 using the California Q-sort. At each age the participants were rated by trained examiner(s), interviewers, and/or teacher(s).

Error in measuring the GFP may be reduced in the Block and Block sample relative to others for several reasons. First, raters largely eliminate the influence of self-presentation effects. This should be especially true for objective raters as is the case in the Block and Block (2006) study in comparison to self ratings or ratings from friends, siblings, or parents who may view the subject of the ratings through rose colored glasses (Connelly & Ones, 2010). Second, the examiners, interviewers, and teachers who rated the participants should have broader training in areas such as child development and have experiences dealing with many children, supplying an ample source for comparison, which should increase the accuracy of their ratings. Third, multiple raters were used, allowing for composite scores from the raters to be computed. Fourth, raters varied across waves adding to the number of raters rating each participant. Fifth, the participants were rated at multiple points in time.

3. Method

3.1. Participants

The data and documentation files were obtained electronically from the Murray Research Archive (Block & Block, 1969–1999). Documentation files describe the sample as roughly two-thirds white, one-quarter black, and one-twelfth Asian, residing in an urban setting, and being heterogeneous with regards to social class and parental level of education. The participants were recruited from two preschools in Berkeley, California. Data collection began when the participants were between the ages of three and four with multiple waves of testing up to age 32. The current investigation focuses on data collected between ages three and four and 18 when the California Q-Sort (Block, 1961) and tests of general intelligence were administered. More detailed information concerning the sample can be seen in Table 1.

3.2. Q-Sorts

The fundamental Q-Sort methodology involves having a rater sort a set of items (called the Q-Set) based on each items relative degree of descriptiveness of what is being rated. The items are arranged and can be rearranged relative to one another in a distribution in which one pole includes items that are most representative of what is being assessed, the other pole represents the antithesis of what is being assessed, and the items in the middle are relatively less descriptive of what is being assessed.

Table 1
Description of data collection waves.

Wave	Age	N	% Female	Raters	IQ test(s)
1	3–4	157	50.31	6 Teachers	Peabody Picture Vocabulary Test Raven's Progressive Matrices Wechsler Preschool & Primary Scale of Intelligence
2	7	98	46.90	2 Examiners & 1 teacher	Peabody Picture Vocabulary Test Raven's Progressive Matrices
3	11	106	49.05	4–5 Examiners	Raven's Progressive Matrices Wechsler Intelligence Scale for Children
4	14	106	50.94	4 Examiners	None
5	18	104	50.96	4 Examiners & 2 interviewers	Wechsler Adult Intelligence Scale