



The correlation between general intelligence (g), a general factor of personality (GFP), and social desirability

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ARTICLE INFO

Article history:

Received 18 August 2009

Received in revised form 28 September 2009

Accepted 1 October 2009

Available online 29 October 2009

Keywords:

General factor of personality

Intelligence

Social desirability

ABSTRACT

The correlation between general intelligence (g), a general factor of personality (GFP), and social desirability was examined in a sample of 507 siblings. Each sibling within a pair was examined separately, creating two groups. Individuals had completed an omnibus personality inventory measuring 20 personality traits as well as a timed, group administered intelligence test. Factor analyses on the personality measure resulted in five factors which were then reduced to either two or three factors and finally to one factor, the GFP. The correlations between the GFPs and g were found to be significant, suggesting that a general factor of personality is not independent with intelligence. The GFP was also found to correlate significantly with social desirability although social desirability did not correlate significantly with g .

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1. Introduction

1.1. Brief overview of the general factor of personality (GFP)

Recently some personality researchers have proposed that there is a general factor of personality (GFP) which accounts for the relationships found between personality dimensions. Musek (2007) described the GFP found in higher-order factor analyses of Big Five measures as the “Big One”, and stated that this factor is a basic personality dimension. Digman (1997) reported that two higher-order factors emerge from the five factors of the Big Five model. DeYoung, Peterson, and Higgins (2002) further refined the two factors and labelled them Stability and Plasticity. Stability included three factors from the Big Five: emotional stability (low neuroticism), agreeableness, and conscientiousness. Plasticity included extraversion and openness to experience. In a variety of data samples and questionnaires, these two factors have been found to have a higher factor in common, the GFP. Rushton and Irwing (2008) reported a GFP in two large samples of the Big Five personality factors. These researchers have also reported the GFP in seven different measures of personality which were not originally designed to measure the Big Five (Rushton & Irwing, 2009a, 2009b, 2009c). Veselka, Schermer, Petrides, and Vernon (2009) also reported the GFP in personality measures which did not measure the Big Five but were included with a measure of the Big Five. In general, the evidence thus far does suggest that a GFP is present

in omnibus personality measures. The present study adds to this body of literature by examining the higher-order factor structure of the 20 personality scales from the Personality Research Form (PRF; Jackson, 1986).

1.2. Intelligence and personality

The hierarchical structure of intelligence is well known, with scales loading onto factors of intelligence, such as verbal and performance, which are then further reduced to general intelligence or g (Spearman, 1927). At the scale level, and at times factor level, some personality dimensions have been found to have significant relationships with intelligence, such as a need for understanding (Harris, Vernon, & Jang, 1998), openness to experience (Brand, 1994), and achievement (Harris, 2004). Interestingly, Musek (2007) described the “Big One” as the non-cognitive aspect of personality, suggesting the GFP would not be related to intelligence. How g relates to the GFP will be examined in the present study.

1.3. Social desirability

The question of what the GFP is has been raised. Rushton, Bons, and Hur (2008) report that the GFP is an overriding personality dimension, is genetic in origin, and which facilitates within-group harmony. Following this description, it would be predicted that the GFP would correlate with other attributes which have an evolutionary significance, such as intelligence. An alternative could be that the GFP is due to social desirability response styles, reflective of consistently responding to questionnaire items in a more

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socially acceptable manner (also referred to as trait social desirability). Bäckström, Björklund, and Larsson (2009) recently demonstrated that the correlations between the factors in the Big Five, are partially due to social desirability. The present study examines the relationship between the GFP and trait social desirability to examine this finding in a questionnaire which was not designed to measure the Big Five.

1.4. Present study

In summary, the present study addresses three areas. First is to examine whether or not a GFP can be found in a questionnaire not designed to measure the Big Five. It is predicted that a factor will emerge as has been found in previous studies examining Big Five scales. The second area explored is the correlation between the GFP and *g*. Finally, the relationship between the GFP and trait social desirability is examined to further assess the suggestion that the common underlying factor in personality measures may be social desirability responding.

2. Method

2.1. Participants

The participants were 507 siblings. The siblings were randomly assigned into two groups for the subsequent analyses, consisting of 254 unrelated individuals in the first group and 253 in the second group. Age was not found to differ between the two groups ($M_1 = 23.87$ years, $SD_1 = 6.23$; $M_2 = 23.48$ years, $SD_2 = 6.10$). The majority of the sample was female (73%).

2.2. Materials and procedures

Individuals completed the Personality Research Form (PRF; Jackson, 1986), measuring 20 personality traits and an additional social desirability response style scale. Also completed was the Multidimensional Aptitude Battery (MAB; Jackson, 1984), consisting of five verbal subtests and five performance subtests, which can be scored to create a general intelligence score. These measures were completed as part of a larger study (see Vernon, Jang, Harris, & McCarthy, 1997).

3. Results and discussion

3.1. Factor analyses of the 20 PRF traits

Principal axis factoring was applied to the correlation matrices for the 20 PRF traits for the two sibling groups separately. The Kaiser–Meyer–Olkin (KMO) values were .73 and .77 for the two groups, respectively. In each group, the scree plot and the eigenvalue greater than unity criteria suggested five factors, accounting for 60.7% and 61.4% of the variance, respectively. The pattern matrices were found to be similar to the principal components results with the entire sample reported by Vernon et al. (1997). For each group, an extraversion factor emerged, including the scales affiliation, change, dominance, exhibition, play, and a negative loading for harm avoidance. The second factor was conscientiousness and included cognitive structure, endurance, order, and a negative loading for impulsivity. The third factor appears to be unique to the PRF scales and was labelled as defensive aggression and included the scales aggression, defence, social recognition, and a negative loading for abasement. The closest resemblance to the Big Five for this factor would be the low end of agreeableness. The fourth factor somewhat resembles neuroticism and was labelled as dependence as it included nurturance, succorance, and a nega-

Table 1

Factor correlations for the five PRF factors following oblimin rotation.

Factor	<i>E</i>	<i>C</i>	<i>DA</i>	<i>Dp</i>	<i>I</i>
Extraversion (<i>E</i>)	1	-.145	.011	.031	.325
Conscientiousness (<i>C</i>)	-.136	1	.002	-.110	.021
Defensive aggression (<i>DA</i>)	.080	-.104	1	.012	-.037
Dependence (<i>Dp</i>)	.034	-.235	-.029	1	-.159
Intellect (<i>I</i>)	.315	.032	-.088	-.268	1

The correlations for the first sample are above the diagonal and the second sample is below the diagonal.

tive loading for autonomy. The fifth factor was intellect or openness to experience and included the scales achievement, sentience, and understanding. Following oblimin rotation, the factors were found to have small to moderately large intercorrelations. The correlations among the factors for the two samples are presented in Table 1.

3.2. Second-order factor structure

For each sample, five factor scores were generated using the regression method. These factor scores were then factor analyzed using principal axis factoring. For the first sample, two factors emerged based on the scree plot and the eigenvalue greater than unity criteria, accounting for 54.45% of the variance. Following oblimin rotation, the pattern matrix had high loadings for extraversion and intellect on the first factor, similar to the results found when factor analyzing the Big Five personality traits (Digman, 1997) and similar to what DeYoung et al. (2002) labelled as Plasticity. The factors dependence, negative conscientiousness, and negative intellect loaded onto the second factor. If dependence is loosely related to neuroticism, then this factor is somewhat similar to what Digman (1997) reported and what DeYoung et al. (2002) labelled as Stability, although in the present study, an agreeableness factor is not present. The defensive aggressive factor was not found to load onto either factor.

For the second sample, three factors emerged, accounting for 56.44% of the variance. As in the first sample, extraversion and intellect were found to load onto the first factor, again replicating previous findings (Digman, 1997). The second factor had the highest loading for dependence, with a moderate negative loading for intellect. The third factor consisted of negative loadings for conscientiousness and intellect, with a moderate loading for defensive aggression. If defensive aggression is disagreeableness, then this factor would represent the negative end of the bi-polar Stability factor reported by DeYoung et al. (2002). Of interest, the intellect factor was found to load onto all of the higher-order factors, suggesting that this personality factor may be a common element in the relationships between the dimensions (see Table 2 for rotated factor loadings). In general, the factors found at the second-order level were somewhat similar to what has been previously reported, but the fact that two factors emerged from one sample and three from the second sample, may require future research.

3.3. General factors and *g*

Factor scores were computed for the higher-order factors for each sample separately using the regression method. These factor scores were then factor analyzed using principal axis factoring. For each sample, a single factor emerged, accounting for 54.89% of the variance in the first sample and 41.82% of the variance in the second sample. Factor scores were generated using the regression method for these super factors (or general factors of personality) and were correlated with the full scale intelligence score from the MAB (a measure of general intelligence or *g*). The correlation

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