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Contents:

Short Communication

Does self-esteem or social desirability account for a general factor of personality (GFP) in the Big Five?

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ARTICLE INFO	ABSTRACT

In four studies, controlling for social desirability or self-esteem had little impact on a general factor of personality (GFP) as measured by its Big Five loadings. In Study 1, we re-analyzed an Internet study of the 44-item Big Five Inventory (BFI) ($N = 628,640$) and found that controlling for self-esteem only reduced the mean loading from .59 to .56. In Study 2, we analyzed an Internet study of the BFI-10 ($N = 126$) and found that controlling for self-esteem only reduced the mean loading from .55 to .50. In Study 3, we re-analyzed data from the 44-item BFI ($N = 128$) and found that controlling for social desirability or self-esteem only reduced the mean loadings from .58 to .56 and .54, respectively. In Study 4, we re-analyzed data on the 44-item BFI ($N = 88$) and found that controlling for social desirability or self-esteem only reduced the mean loadings from .56 to .55 and .54, respectively. Thus, social desirability and self-esteem do not appear to account for the GFP, suggesting it is substantive rather than an artifact of evaluative bias.

1. Introduction

A recent hypothesis is that a general factor of personality (GFP) occupies the apex of the multi-factorial hierarchy of personality in the same way that g, the general factor of mental ability, occupies the apex in the organization of cognitive abilities (Hofstee, 2001; Musek, 2007; Rushton, Bons, & Hur, 2008). Among the inventories the GFP has been extracted from are: the Big Five Inventory, the California Psychological Inventory, the Comrey Personality Scales, the Dimensional Assessment of Personality Pathology, the EAS Temperament Scales, the Guilford–Zimmerman Temperament Survey, the Jackson Personality Inventory, the Hogan 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; Erdle & Rushton, 2010; Irwing & Rushton, in press; McIntyre, 2010; Musek, 2007; Rushton, Irwing, & Booth, 2010; Rushton et al., 2008; Rushton & Erdle, 2010; Rushton & Irwing, 2008, 2009, 2009a, 2009b, 2009c, 2009d; Schermer & Vernon, 2010; Van der Linden, te Nijenhuis, & Bakker, 2010; Veselka et al., 2009; Veselka, Schermer, Petrides, & Vernon, 2009).

Individuals at the high end of the GFP as measured by the Big Five are characterized as agreeable, emotionally stable, conscien-

tious, extraverted, and intellectually open. The GFP in the Big Five has been found to be positively related to self-esteem, life satisfaction, the behavioral activation/approach system (BAS), positive affect, and generalized expectancy of reward, and negatively related to depression, the behavioral inhibition system (BIS), negative affect, and generalized expectancy of punishment (Erdle & Rushton, 2010; Musek, 2007; Rushton & Erdle, 2010).

The explanation we favor for the GFP is that it arose through evolutionary selection for, and social learning of, desirable traits that facilitate performance across a wide range of contexts (Erdle & Rushton, 2010; Rushton et al., 2008). The main alternative to the GFP being substantive is that it results from artifacts of evaluative bias such as social desirability responding and halo effects (Anusic, Schimmack, Pinkus, & Lockwood, 2009; Bäckström, Björklund, & Larsson, 2009; Erdle, Gosling, & Potter, 2009). However, even after controlling for social desirability using partial correlations and other procedures, there was little or no impact found for social desirability or self-esteem in explaining the GFP (Rushton & Erdle, 2010) and its nomothetic structure (Erdle & Rushton, 2010; Rushton & Erdle, 2010).

In this paper, we further test the artifactual hypothesis by examining the effects of partialing out or in other ways holding social desirability independent of self-esteem when extracting the GFP from the Big Five. We predicted that controlling for social desirability or self-esteem would have little impact on factor loadings, thereby suggesting the GFP is substantive rather than an artifact of evaluative bias.

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2. Study 1: An internet study of the BFI and self-esteem (*N* = 628, 640)

2.1. Method

We re-analysed the correlations among self-esteem and the Big Five in 628, 640 Internet respondents (45% male; ages from 9 to 90, median = 24) reported by Erdle et al. (2009). The Big Five were measured using the 44-item Big Five Inventory (BFI: John & Srivastava, 1999), and self-esteem by the Single-Item Self-Esteem scale (SISE: Robins, Hendin, & Trzesniewski, 2001). The BFI is a 44-item self-report measure comprised of short items assessing the Big Five factors (OCEAN: Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism reverse keyed to reflect Emotional Stability). Items are responded to on a 5-point scale ranging from "strongly disagree" to "strongly agree." The SISE scale is the single item, "I see myself as someone who has high self-esteem," rated on a 5-point scale ranging from "strongly disagree" to "strongly agree." The SISE has high test–retest reliability and criterion validity above .80 with the Rosenberg Self-Esteem (RSE) scale and shows a similar pattern of validity coefficients as the RSE across 37 constructs.

2.2. Results

Correlations of the BFI scales with self-esteem ranged from .13 to .48, with a mean of .29. A principal components analysis was carried out on the correlations among the BFI scales. All five scales loaded positively on the GFP from .35 to .71, with a mean of .59. A principal component analysis of the partial correlations among the BFI scales with self-esteem controlled only reduced the mean loading to .54, with all five scales continuing to load positively from .21 to .74 (see Table 1).

3. Study 2. An internet study of the BFI-10 (*N* = 126)

3.1. Method

The 126 Internet respondents were from the US (67%) and 14 other countries (33%), were 21% male, ranging in age from 16 to 70 years. The GFP was measured using the 10-item version of the Big Five Inventory (BFI-10; Rammstedt & John, 2007). Two items (one positively-keyed and one negatively-keyed) were taken from each of the original scales of the 44-item BFI. Items are responded to on a 5-point scale ranging from "strongly disagree" to "strongly agree." The scales of the BFI-10 are both reliable and valid (Rammstedt & John, 2007). Scores for the GFP were calculated by aggregating across the five scales, reverse keying Neuroticism to reflect Emotional Stability. An alpha coefficient of .55 was found for the GFP based on the BFI-10 items (reversing negatively keyed

items). As in Study 1, self-esteem was measured by the Single-Item Self-Esteem scale (SISE: Robins et al., 2001).

3.2. Results

The correlation between the GFP and self-esteem was .50. A principal components analysis of the correlations between the BFI-10 scales showed that all five scales loaded on the GFP from .34 to .65 with a mean of .55. Controlling for self-esteem only reduced the mean loading to .50, with all five scales continuing to load positively from .33 to .63 (see Table 2).

4. Study 3: The Huron University College sample (*N* = 128)

4.1. Method

In a re-analysis of data from Erdle and Rushton (2010, Study 1), 128 mainly middle-class Caucasian university student volunteers (39% male; median age = 18 years) completed paper- and pencil-measures in a large classroom in November 2008. The GFP was measured using the 44-item Big Five Inventory (BFI; John & Srivastava, 1999). Scores for the GFP were calculated by aggregating across the Big Five scales, reverse keying Neuroticism to reflect Emotional Stability. An alpha coefficient of .80 was found for the GFP based on the BFI items. Social desirability was measured by the 33-item Marlowe-Crowne social desirability scale (M-C; Crowne & Marlowe, 1964). Socially desirable but infrequent behaviors are rated "True" or "False." As in Studies 1 and 2, self-esteem was measured by the Single-Item Self-Esteem scale (SISE; Robins et al., 2001).

4.2. Results

The correlations between the GFP and social desirability and self-esteem were .30 and .45, respectively. The correlation between social desirability and self-esteem (.04) was not significant. A principal components analysis of the correlations among the BFI scales showed that all five scales loaded positively on the GFP from .39 to .76 with a mean of .58. Controlling for social desirability or self-esteem only reduced the mean loadings to .56 and .54, respectively, with all scales continuing to load positively from .24 to .75 (see Table 3).

5. Study 4: A replication of Study 3 (*N* = 88)

5.1. Method

In a re-analysis of data from Erdle and Rushton (2010, Study 2), 88 mainly middle-class Caucasian university student volunteers (39% male; median age = 18 years) completed, in November 2009, the same paper- and pencil-measures described in Study 3.

Table 1
Loadings from factor analyses of bivariate and partial correlations among BFI scales from Study 1 (*N* = 628, 640).

| | General factor of personality | |
	Bivariate	SE partials
E	.56	.34
O	.35	.21
A	.65	.74
C	.61	.60
ES	.71	.66
Mean	.59	.56

Note: E = Extraversion; O = Openness; A = Agreeableness; C = Conscientiousness; ES = Emotional stability; SE partials = Self-esteem controlled.

Table 2
Loadings from factor analyses of bivariate and partial correlations among BFI-10 scales from Study 2 (*N* = 126).

| | General factor of personality | |
	Bivariate	SE partials
E	.65	.56
O	.34	.47
A	.59	.50
C	.52	.63
ES	.60	.33
Mean	.55	.50

Note: E = Extraversion; O = Openness; A = Agreeableness; C = Conscientiousness; ES = Emotional stability; SE partials = Self-Esteem controlled.

Table 3
Loadings from factor analyses of bivariate and partial correlations among BFI scales from Study 3 (*N* = 128).

	General factor of personality		
	Bivariate	SD partials	SE partials
E	.49	.59	.24
O	.39	.46	.24
A	.53	.35	.67
C	.66	.56	.69
ES	.76	.75	.70
Mean	.58	.56	.54

Note: E = Extraversion; O = Openness; A = Agreeableness; C = Conscientiousness; ES = Emotional stability; SD partials = Social desirability controlled; SE partials = Self-esteem controlled.

Table 4
Loadings from Factor Analyses of Bivariate and Partial Correlations among BFI Scales from Study 4 (*N* = 88).

	General factor of personality		
	Bivariate	SD partials	SE partials
E	.45	.46	.28
O	.28	.48	.33
A	.69	.60	.73
C	.49	.34	.50
ES	.75	.76	.73
Mean	.56	.55	.54

Note: E = Extraversion; O = Openness; A = Agreeableness; C = Conscientiousness; ES = Emotional stability; SD partials = Social desirability controlled; SE partials = Self-esteem controlled.

5.2. Results

The correlations between scores on the GFP and social desirability and with self-esteem were .31, and .33, respectively. The correlation between social desirability and self-esteem (.15) was not significant. A principal components analysis of the correlations among the BFI scales showed that all five scales loaded positively on the GFP from .28 to .75 with a mean of .56. Controlling social desirability or self-esteem only reduced the mean loadings to .55 and .54, respectively, with all scales continuing to load positively from .28 to .76 (see Table 4).

6. Discussion

Across studies, results support the hypothesis that a GFP in the Big Five is not an artifact of social desirability or self-esteem. While the GFP was found to correlate significantly with these variables, when they were controlled for statistically or otherwise kept independent, the GFP continued to be extracted from the Big Five. Taken together, these results join those previously showing no evidence that the GFP and its associated variables are artifacts of evaluative bias (Erdle & Rushton, 2010; Rushton & Erdle, 2010). The explanation we favor for the results is that the GFP is substantive, having arisen partly through gene-based natural selection for adaptive personality traits (Erdle & Rushton, 2010; Rushton et al., 2008).

There are limitations to the study. For example, measuring self-esteem with the one-item SISE scale raises issues about the validity and reliability of this measure. Where necessary, we now provide a slightly fuller description of the SISE including its reliability, validity, and use in the literature. However, it would be of great interest to see a wider range of self-esteem, social desirably, Big Five, and other scales used to test more fully the validity of the GFP. The current paper makes a small step forward in showing the GFP is substantive.

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