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# What facets of openness and conscientiousness predict fluid intelligence score?

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## Abstract

The aim of this study was to investigate the relationship of fluid intelligence (gf) with trait Openness and Conscientiousness. A total of 2658 participants completed the NEO PI-R [Costa Jr, P. T. & McCrae, R. (1985). Revised NEO Personality Inventory and Five-Factor Inventory Professional Manual. Odessa, FL: Psychological Assessment Resources] and the GMA: Abstract test of cognitive ability [Blinkhorn, S. F. (1985). Graduate and Managerial Assessment Manual and User Guide. Dorchester: Dorset Press]. Correlational analysis showed that only the Ideas and Actions sub-facets of Openness were positively correlated with gf. Order, Self-Discipline and Deliberation sub-facets of Conscientiousness were negatively correlated with gf. Regressions showed that the sub-factors of each of the traits accounted for 5% of the total variance in gf. These findings are discussed in an attempt to explain how the relationship between Openness, Conscientiousness and gf may have developed.

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## 1. Introduction

Researchers in the fields of personality and intelligence have recently showed a renewed interest in this interface, in an attempt to provide a more comprehensive explanation on how these constructs account for the psychological variability between individuals (Saklofske & Zeidner, 1994; Sternberg &

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Ruzgis, 1994). The first studies which looked at the relationship between personality and intelligence, used personality questionnaires based on the three factors of Eysenck's model, Neuroticism, Extraversion and Psychoticism (Eysenck & Eysenck, 1985; Jitendra & Dubey, 1976; Marta & Bela, 1983; Mezera, 1983; Singh & Sehgal, 1979). However, since the development of the Five-Factor model (Costa & McCrae, 1985), research has tended to focus on how the Big 5 personality factors (Neuroticism, Extraversion, Openness to Experience, Agreeableness and Conscientiousness) correlate with measures of intelligence (Ackerman & Heggestad, 1997; Kyllonen, 1997; Zeidner & Matthews, 2000).

The major replicated findings on the relationship between intelligence and the Big 5 factors of personality are that intelligence is positively correlated with Openness to Experience (Ackerman & Heggestad, 1997; Austin et al., 2002; Brand, 1994; Furnham, Chamorro-Premuzic, & Moutafi, 2005; McCrae, 1994; Moutafi, Furnham, & Crump, 2003; Moutafi, Furnham, & Paltiel, 2005; Zeidner & Matthews, 2000), negatively correlated with Neuroticism (Ackerman & Heggestad, 1997; Furnham, Forde, & Cotter, 1998; Kyllonen, 1997; Zeidner & Matthews, 2000) and Conscientiousness (Chamorro-Premuzic, Moutafi, & Furnham, submitted for publication; Moutafi et al., 2003; Moutafi, Furnham, & Paltiel, submitted for publication; Moutafi, Furnham, & Paltiel, 2004) and occasionally correlated with Extraversion, the sign of the correlation depending on the testing conditions (Ackerman & Heggestad, 1997; Austin et al., 2002; Furnham et al., 1998; Lynn, Hampson, & Magee, 1984; Moutafi et al., 2003; Moutafi, Furnham, & Paltiel, 2005).

The relationship between Extraversion and intelligence is believed to be mediated by the nature of the IQ test, due to the resting level of cortical arousal being higher for Introverts than for Extraverts (Eysenck & Eysenck, 1985). Consequently, Extraverts have been found to perform better on timed tasks (Rawlings & Carnie, 1989) whereas Introverts tend to perform better on tasks requiring insight and reflection (Matthews, 1992). This suggests that Extraversion is mostly related to intelligence test performance, rather than to intelligence per se (Moutafi, Furnham, & Hackston, submitted for publication). Similarly, it has been proposed that anxiety component of Neuroticism, which affects intelligence test performance (Moutafi, Furnham, & Tsaousis, in press). This is because Neurotic individuals experience higher levels of test anxiety, and anxiety causes individuals to engage in significantly more task-irrelevant processing (worry), which interferes with their performance (Eysenck, 1979). Consequently this finding also implies that Neuroticism is actually more systematically related to intelligence test performance than to intelligence per se.

This study will focus on the relationship of fluid intelligence (gf) with Openness and Conscientiousness, as they are the two personality factors that appear to be empirically and conceptually related to intelligence per se rather than primarily to intelligence test performance. The aim is to investigate which second order facets of Openness and Conscientiousness are related to intelligence, so as to explain why they are linked and perhaps how the relationship may have developed. Intelligence will be measured by the Graduate and Managerial Assessment: Abstract (GMA:A) (Blinkhorn, 1985), which is a measure of gf, as it measures abstract reasoning.

### *1.1. Openness to experience*

Openness to Experience has been found to correlate with general intelligence, levels ranging from about  $r=.30$  (Austin et al., 2002), to  $r=.45$  (Kyllonen, 1997). Features of Openness are aesthetic sensitivity, awareness of one's emotions, vivid imagination, preference for novelty and variety and

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