

Fluid Intelligence, Crystallized Intelligence, and the Openness/ Intellect Factor

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We investigated the relations of the Big Five personality factor of Intellect or Openness to Experience with the crystallized and fluid aspects of measured intelligence. Approximately 500 participants completed the Personality Research Form (PRF) and the Multidimensional Aptitude Battery (MAB). An Openness/Intellect scale, defined as the sum of four PRF scales known to be markers of the Openness/Intellect factor (Understanding, Sentience, Change, and Autonomy), was substantially correlated with MAB subtests that assess crystallized knowledge (the Verbal Scale subtests except Arithmetic), but only weakly correlated with MAB subtests that assess fluid ability (the Performance Scale subtests and Arithmetic). Among the fluid ability subtests, those containing pictures or meaningful visual stimuli were somewhat correlated with Openness/Intellect, whereas those containing numbers or abstract shapes were virtually uncorrelated with Openness/Intellect. © 2000 Academic Press

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Personality structure is often summarized in terms of the “Big Five” factors (see Digman, 1990; Goldberg, 1993; McCrae & John, 1992). Four of these dimensions are known as Extraversion, Agreeableness, Conscientiousness, and Emotional Stability (versus Neuroticism), and the fifth is known as Openness to Experience or as Intellect. This study investigates the relations between the “fifth factor” of personality and different aspects of measured intelligence.

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Conceptualizations of the Fifth Factor

Costa and McCrae's (1985, 1992a) Openness to Experience construct involves the tendency to fantasize (Fantasy), aesthetic sensitivity (Aesthetics), awareness of one's emotions (Feelings), preference for novelty (Actions), intellectual curiosity (Ideas), and preference for nontraditional values (Values). The lexical Intellect factor involves artistic imagination, introspective reflection, and intellectual knowledge (Goldberg, 1994; Saucier, 1994) in addition to independence and nonconformity (Caprara & Perugini, 1994; De Raad, Hendriks, & Hofstee, 1992). Johnson (1994) and Saucier (1994) have noted that the aspects of Openness to Experience that define that factor most strongly—namely Aesthetics and Ideas—are also the aspects most strongly related to lexical Intellect. As a compromise between the two conceptualizations, we refer to the fifth personality factor as Openness/Intellect.

Relations between Openness/Intellect and Measured Intelligence

Previous research has indicated that Openness/Intellect—usually measured by the NEO Personality Inventory(-Revised) [NEO-PI(-R); Costa & McCrae, 1985, 1992a]—is correlated with intelligence test scores. For example, McCrae (1993–1994) reported a .33 correlation between NEO-PI-R Openness to Experience and the Full Scale IQ of the Wechsler Adult Intelligence Scale (WAIS), and Holland, Dollinger, Holland, and MacDonald (1995) reported a .42 correlation between NEO-PI Openness to Experience and the WAIS-Revised Full Scale IQ.

Although the correlation between Openness/Intellect and measured intelligence is well established, an interesting question involves the relation of Openness/Intellect to different aspects of intelligence. For example, one might expect that tasks measuring vocabulary or general knowledge would be substantially correlated with personality traits such as intellectual curiosity, whereas tasks demanding reasoning or efficient information-processing would be nearly independent of "Typical Intellectual Engagement" (Goff & Ackerman, 1992). Goff and Ackerman (1992), using Cattell's (1963) distinction between "crystallized" and "fluid" abilities, predicted that crystallized intelligence (measured by vocabulary-related tasks) would be more strongly related to NEO-PI-R Openness to Experience facets than would fluid intelligence (measured by reasoning tasks). The results supported those predictions: crystallized ability correlated .32 with Openness to Ideas, whereas fluid ability correlated only .13 with Openness to Ideas (Ackerman & Goff, 1994).

If the Openness/Intellect factor is, in fact, more strongly correlated with crystallized than with fluid abilities, then one would expect that factor to correlate fairly strongly with the WAIS(-R) Verbal Scale subtests, which mainly demand verbal knowledge, but correlate very weakly with the Performance Scale subtests, which demand nonverbal reasoning, spatial visualiza-

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