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Is conscientiousness positively or negatively related to intelligence? Insights from the national level

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ABSTRACT

Although conceptually conscientiousness should be positively associated with intelligence, existing empirical data do not support this hypothesis. Several recent investigations reported a negative association of the two variables. In the present paper we examine the national data on personality and intelligence. We used the NEO-PI-R data on national personality. We were interested how the analysis conducted at national level may shed new light on the relationship between conscientiousness and cognitive ability. The most important finding concerned the differences in correlations between self-report and observer-rating conscientiousness scores with IQ. The former was negatively associated with cognitive ability, while the latter positively. The analyses of the conscientiousness facets revealed, that in regression models three components of conscientiousness predicted national intelligence. Specifically, achievement striving and deliberation were negatively associated with IQ, while dutifulness was in a positive relationship with cognitive ability. Interestingly, this pattern was the same in self and observer rating scores.

1. Introduction

The relationship between personality and cognitive ability has been widely explored in the psychological literature (e.g. Ackerman & Heggestad, 1997; Zeidner & Matthews, 2000). One of the most interesting, though puzzling, results concerns conscientiousness (C). Intuitively, this personality trait should be positively related to intelligence. DeYoung (2011) stresses the fact, that conscientiousness is closely and negatively linked to impulsivity. Indeed, some researchers view impulsivity as a negative pole of conscientiousness (Markon et al., 2005). The former has been found to correlate positively with delay discounting (e.g. Ostaszewski, 1996). Delay discounting is typically measured through a series of choices between smaller, more immediate rewards and larger, delayed rewards, with similar outcomes obtained whether these choices are hypothetical or actually result in reward (Shamosh & Gray, 2008). Additionally, a meta-analysis conducted by Shamosh & Gray (2008) showed that delay discounting is negatively associated with cognitive ability.

Moreover, conscientiousness and cognitive ability are positive correlates of several real life outcomes (e.g. Chamorro-Premuzic, 2007). It was proved that both variables are especially important predictors of job performance (Barrick & Mount, 1991; Goff & Ackerman, 1992), school achievements (Chamorro-Premuzic & Furnham, 2004, 2006), and health-related behavior (Gottfredson & Deary, 2004; Bogg & Roberts, 2004). Interestingly, in most studies the effects of conscientiousness and intelligence on life outcomes appear to be independent (see Chamorro-Premuzic & Furnham, 2004).

Although conceptually conscientiousness should be positively associated with intelligence, existing empirical data do not support this hypothesis. Most results did not reveal significant correlations of this personality dimension with various cognitive abilities (Ackerman & Heggestad, 1997). However, several recent investigations reported a negative association of the two variables (Moutafi et al., 2004, 2005). The compensation mechanism has been proposed as a possible explanation of this result (von Stumm, Chamorro-Premuzic & Ackerman, 2011). Particularly, it has been suggested that less able individuals may compensate for their lower intellectual capacity by developing a high level of conscientiousness. People with high intelligence do not need to be very conscientious as they can rely solely on their intellect to accomplish most tasks. To fully understand this idea, one need bear in mind Cattell's (1971) distinction between fluid intelligence (*gf*) which represents information-processing and reasoning ability, dependent on the efficient functioning of the central nervous system, and crystallized intelligence (*gc*) representing abilities to acquire, retain, organize, and conceptualize information that is acquired through experience and education. Since *gf* is more biologically determined, Moutafi et al. (2004) suggest that it is *gc* that can be increased by hard work persistence and dutifulness develop to compensate for quick-wittedness.

In the present paper we examine the national data on personality and intelligence. We were interested how the analysis conducted at national level may shed new light on the relationship between

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conscientiousness and cognitive ability. Over the last decade, a growing interest in investigating differences in psychological and behavioral traits at the national level has been observed. The initial studies were described by Lynn and Vanhanen (2002), who first presented average population IQs for 81 nations measured from samples given a variety of intelligence tests. Subsequently, the authors calculated IQs for 113 and finally 137 countries (Lynn & Vanhanen, 2006). They also provided estimates for additional nations, based on measured IQs of neighboring countries with similar population and culture. Although Lynn and Vanhanen's research were criticized (Hunt & Sternberg, 2006; Wicherts, Dolan, Carlson, & van der Maas, 2010), a number of subsequent studies shown that estimations of national IQ predict many important outcomes, such as GDP, life expectancy, educational achievements, crime rates etc. (see a review in Lynn & Vanhanen, 2012a).

So far, few attempts have been made to assess Big Five personality traits among different countries. For instance, Schmitt et al. (2007) reported data from 56 nations on the Big Five Inventory (BFI). As part of a broader project, the BFI was translated from English into 28 languages and administered to convenience samples of around 200 participants (mostly college students) from each country. Recently Bartram (2012, 2013) considered a large data set from the Occupational Personality Questionnaire (OPQ), an instrument widely used around the world in the field of occupational assessment (i.e., for selection or development in the workplace). The OPQ measures 32 work-related personality traits from which "Big Five" scale scores can be produced (by scale aggregation: Bartram & Brown, 2005). Bartram (2013) used the results from the OPQ for cross-cultural comparisons. His analysis was based on data from 31 different countries, with a total sample of over one million participants. The data were obtained through online administration from people who were being assessed either for job selection or succession planning purposes or for personal development within a job.

One of the biggest and possibly most reliable data sets was provided by McCrae et al. (2005) on Revised NEO Personality Inventory (NEO-PI-R) scales. In this study, college students from 51 nations rated an individual from their country whom they knew well. Raters could choose anyone they knew well as a target, which resulted in a wider age and educational range than would normally be obtained in self-report studies. The mean scores of 51 cultures were standardized and transformed into *T*-scores relative to international means. The authors concluded that the five factors are universal across age and sex groups as well as cultures. Most important, NEO-PI-R allows to assess five higher-order personality traits as well as six facets within each trait. Moreover, before the project described in the 2005 paper, McCrae (2002) provided also data on self-report NEO-PI-R scales.

Lynn and Vanhanen (2002, 2012b) assumed that results observed among individuals should hold also for nations, because the latter can be considered as aggregates of individuals. Following this assumption one might expect a negative association between conscientious behavior and cognitive ability measured at the country level. So far, two studies explored the pattern of associations between Big Five traits and national IQs (Stolarski, Zajenkowski & Meisenberg, 2013; Zajenkowski, Stolarski & Meisenberg, 2013). In these investigations positive correlations of intelligence with openness and extraversion were found, whereas conscientiousness was not significantly related to IQ (Stolarski et al., 2013). However, there are some reasons to believe, that this result might be different when other data are analyzed. First, Stolarski et al. (2013) used personality data from McCrae et al. (2005), which were based on observer-ratings, and studies reporting the negative C-IQ association used self-ratings. Therefore, it is possible, that results from the self-report questionnaires measured at the national level will show different relationship with intelligence. Second, Mottus, Allik, and Realo (2010) notice that some associations between conscientiousness measured at the national level and external variables are not consistent with theoretical expectation. The authors suggest that one should analyze not only the higher-order trait, but also its lower-level facets. Indeed, Mottus et al. (2010) found, that different facets of C relate differently to external criteria.

2. Method

National IQ is from Lynn and Vanhanen (2006), with the extensions and amendments reported in Lynn and Vanhanen (2012b). Missing data points were extrapolated from the school achievement data as reported in Meisenberg and Lynn (2011).

Conscientiousness is taken from two international studies of the Five Factor Model, which used NEO-PI-R (McCrae, 2002; McCrae et al., 2005). One of these researchers (McCrae et al., 2005) used observer-rating method to assess personality, while others used self-report. McCrae (2002) and McCrae et al. (2005) also used data on facets from the conscientiousness scale, including competence, order, dutifulness, achievement, self-discipline, and deliberation.

3. Results

First, we correlated conscientiousness scores and their facets with IQ (Table 1). Generally we found, that self-report measure of C reported by McCrae (2002) was negatively associated with cognitive ability, whereas observer-rating score from McCrae et al. (2005) tended to positively correlate with IQ, although the latter result was not significant. Interestingly, in case of self-report, the conscientiousness facets tend to be negatively related with intelligence. On the other hand, observer-rating scores are more diverse, specifically, competence, dutifulness and self-discipline facets are positively correlated with IQ, while deliberation is negatively associated with cognitive ability. Moreover, the correlations of observer-rated order and achievement with IQ are close to zero.

Further, using Steiger's (1980) method we examined whether the correlation magnitudes differ with respect to IQ and self-report and observer-rating scores (see Table 1). All the respective correlation coefficients are significantly different, excepting deliberation facet. Thus, we may conclude that the method of measurement significantly influences the size and (in some cases) direction of the relationships between country-level C facets and IQ score. For self-report measurement of C, the correlation coefficients tend to be negative, whereas for the observer-ratings, the coefficients are all shifted towards positive values (see Fig. 1). This phenomenon might be labeled as the *perspective shift* effect.

What is even more interesting, we can observe a specific pattern of the correlations: definitely some facets of C (i.e., competence, dutifulness, self-discipline) tend to correlate more positively with IQ (or less

Table 1
Comparison of the correlation coefficients for self-report ($n = 40$ countries) and observer-rating (n = 46 countries) conscientiousness and IQ.

	C (general)	Competence	Order	Dutifulness	Achievement	Self-discipline	Deliberation
				Self-report			
IQ	−.39*	−.18	−.54**	−.02	−.61**	−.21	−.51**
				Observer-rating			
	.11	.29*	−.06	.42**	−.08	.30*	−.31*
Z	−2.23*	−2.10*	−2.68**	−1.96*	−3.08**	−2.27*	−.89

* $p < .05$.
** $p < .001$.