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## Beliefs about the relationships between personality and intelligence

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Running head: ABILITY AND PERSONALITY STEREOTYPES

**Beliefs about the relationships between personality and intelligence**

### **Abstract**

Participants were asked to assess personality traits of a typical individual with high or low academic or practical abilities. Opinions about the perceived relationships between personality and intelligence strongly converged. A typical intelligent person was believed to be emotionally stable, extraverted, open to new experiences, and conscientious, differing on these traits diametrically from a typical individual endowed with low abilities. The perceived associations between ability and personality traits contrast with the typically weak correlations found between psychometrically measured intelligence and personality. Despite a considerable overlap between ability-related personality stereotypes and social desirability ratings of the personality traits, there was a discrepancy in the attitudes towards agreeableness. Although the facets of agreeableness were regarded as socially advantageous, participants did not believe that trust, straightforwardness and altruism are necessarily characteristic of a smart person.

Keywords: personality stereotypes; stereotype accuracy; intelligence; agreeableness

### **Introduction**

Covariation pattern in self- or other-rated personality traits is remarkably stable, regardless of measuring instrument, age group, language, and culture (McCrae & Costa, 1997). For instance, in all locations studied to date, individuals who believe that they are talkative tend also to think that they are happy, and those who report depression also describe themselves as being hostile towards others. Such covariation may be based on actual observations, but it may also occur because words such as “talkative” and “happy” are semantically overlapping (D’Andrade, 1965). This pattern of perceived relationship among personality traits is usually called the *implicit personality theory* (Schneider, 1973).

However, implicit personality theory must not necessarily be limited to the perceived covariation between personality traits. In the same way, one can also talk about the perceived covariation between personality traits and other attributes such as, for example, sex, ethnicity, and intelligence. Such beliefs are typically referred to as stereotypes. There is a pervasive belief that men are more dominant and emotionally stable than women, whereas women, in turn, are more agreeable than men (Williams, Satterwhite, & Best, 1999); empirical data demonstrates that this belief is likely to be based on real observations (Costa, Terracciano, & McCrae, 2001; Schmitt, Realo, Voracek, & Allik, 2008). In contrast, perceived national character appears to be unrelated to average personality test scores of nation members (Terracciano et al., 2005).

Although the link between self-rated personality and psychometrically measured intelligence has been studied for decades, surprisingly little is known about the *perceived* relationships of personality to intelligence. Some psychologists believe that

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general ability is so potent and ubiquitous that it is an inseparable complement to many pure personality factors (Cattell, 1957). Nevertheless, empirical studies have typically found only modest correlations between measures of personality and intelligence (Eysenck, 1994). Of the Big Five dimensions, only Openness has demonstrated a fairly small but still steady overlap with intellectual abilities (Costa & McCrae, 1992). At the level of perceived relationships, however, several findings point to the existence of a general belief that intelligent people can be distinguished from less intelligent not only by their mental capacities but also by their personality dispositions. For example, when people have been asked to name famous examples of an intelligent person, Martin Luther King, Mahatma Gandhi, and Mother Theresa have regularly been suggested, indicating that spiritual strength is considered an indicator of intelligence (Paulhus, Wehr, Harms, & Strasser, 2002). When lay judges are asked what they mean by the term *intelligence* or *mental abilities*, besides cognitive aptitude, they usually propose competencies related to social and interpersonal skills (Paulhus et al., 2002; Sternberg, 1985; Sternberg, Conway, Ketron, & Bernstein, 1981). Nevertheless, there is no detailed knowledge on how intelligence is perceived to be related to a wider spectrum of personality traits.

If there are regularities in the way people perceive the relationships between ability and personality, it is also worth looking for their possible underpinnings. One possible mechanism is related to evaluative biases. There is little doubt that high intelligence is considered a socially desirable characteristic, related to numerous positive outcomes in academic, professional, and everyday life (Gottfredson, 1997). It is possible that when people think about a typical person believed to have high intelligence, they also attribute other socially desirable characteristics to the person. In other words, intelligent people may be described as emotionally stable, dependable,

and kind to others, because these traits are usually seen as socially beneficial. In the same way, it is possible that less intelligent people are associated with negative traits and believed to be neurotic, unreliable, and antagonistic. If this implicit link between intelligence and social desirability exists, then we can expect similarities between the mean personality ratings of a typical high-intelligence person and mean levels of social desirability of the respective personality traits.

It is important to know and be aware of peoples' implicit trait theories because it is highly likely that they influence trait ratings of real people in both research and everyday life settings. For example, Paulhus and John (1998) argue that it is exactly because of the evaluative biases that the Big Five dimensions are intercorrelated and produce higher-order "superfactors". A similar conclusion that widely shared schemas concerning the covariation of traits distort self- and observer-ratings of personality was recently reached by McCrae et al. (in press). Similarly, it is possible that perceived level of intelligence affects the personality ratings made about real people: knowing target's level of intellectual ability, the rater might be tempted to construe his or her personality on the basis of the implicit trait theory. Knowing this theory can help to take its effect into account.

This study has two main goals. (1) We aimed to investigate the perceived relationships between intelligence and the personality traits of the Five Factor Model (McCrae & John, 1992) by collecting lay people's opinions about the personalities of both intellectually gifted and untalented individuals. Because intelligence can be conceptualized in several different ways, for example "academic" versus "practical" (Sternberg, 1985; Sternberg et al., 1981), we used two different conceptualizations of intellectual abilities. (2) In order to study the possible role of social desirability in the formation of the stereotypic personality perceptions, we compared the perceived

relationships between intelligence and personality with rated social desirability of personality traits.

## Methods

### *Sample 1: Academic Intelligence*

*Participants.* Participants were 289 Estonian-speaking students (63 men, 222 women, and 4 participants of unknown sex; mean age  $19.2 \pm 1.3$  years) attending introductory psychology courses at the University of Tartu and Tallinn University. Participation was voluntary.

*Measures and procedure.* An Estonian version of the National Character Survey (Terracciano et al., 2005) was modified to assess perceived character of typical individuals with high or low academic ability. The modified questionnaire, the NEO Profiler 30 (NEO-P30), consists of 30 bipolar items describing facets of the Revised NEO Personality Inventory (Costa & McCrae, 1992). For example, the Extraversion facet Warmth was assessed by asking how likely, on a five-point scale, a typical woman with high academic ability was to be *friendly*, *warm*, and *affectionate* versus *cold*, *aloof*, and *reserved*. Participants were randomly assigned to four groups: the first ( $N = 80$ ) and second ( $N = 82$ ) groups had to think of and describe a typical man and a typical woman with high academic ability, respectively, while the third ( $N = 62$ ) and fourth ( $N = 65$ ) groups had to think of and describe a typical man and a typical woman with low academic ability, respectively. In the instructions participants were provided with a formal definition of academic ability:

“People differ from each other with respect to their mental abilities. Some people have very high mental ability: they have wit and they can easily solve very different problems. They gain new knowledge and skills with little effort

and they are well informed about a variety of things. At the same time, some people are mentally less able: they are not so quick and efficient in thinking and it is more difficult for them to gain new knowledge and skills and develop an understanding of the world around them.”

### ***Sample 2: Practical Intelligence***

*Participants.* The participants were 109 Estonian-speaking volunteers (22 men and 87 women; mostly non-students) with a mean age of  $37.8 \pm 11.2$  years. They were reached with the help of a collaborator (her friends, colleagues, their friends, etc.).

*Measures and procedure.* As in *Sample 1*, the NEO-P30 was used, however with different instructions. The first difference was that the targets were not divided into groups according to sex, only on the basis of ability. Secondly, instead of academic ability, participants were asked to think of and describe a typical person with high or low practical ability. They were also provided with a definition of practical ability:

“People differ from each other with respect to how easily and how well they can attain the goals they have set themselves. Some people can always come out as winners. In other words, some people have very high practical abilities to cope with everyday life. Some other people, on the contrary, tend to fall short in attaining their goals and even quite small difficulties can bring along another failure. We can say that these people have low practical abilities and they have poorer chances of succeeding in life.”

A typical person with high practical ability was described by 51 participants and a typical person with low practical ability was rated by 58 participants.



***Sample 3: Typical Ability Level***

*Participants.* The participants were 181 Estonian-speaking students (55 men and 126 women; mean age  $20.0 \pm 1.4$  years) attending introductory psychology courses at the University of Tartu and Tallinn University. Participation was voluntary.

*Measures and procedure.* Participants were presented 60 short unipolar descriptions of either the low or high pole of each of the 30 facet scales of the NEO-PI-R (Konstabel & Virkus, 2006). The set of descriptions is called the Short Five-Factor Inventory or S5 (Konstabel & Lönnqvist, 2007). As an example, the description of a typical high-scorer on the N1:Anxiety was:

“He or she is often nervous and fearful, feels anxious, and worries that something might go wrong.”

The self-report data of Konstabel and Lönnqvist (2007) provide preliminary evidence of the validity of the S5: Its scales were highly correlated to the respective facet scales of the Estonian NEO-PI-R (Kallasmaa, Allik, Realo, & McCrae, 2000) and the EPIP-NEO (Mõttus, Pullmann, & Allik, 2006); the median correlations across the 30 subscales were .69 and .76, respectively.

Subjects were provided with the same definition of academic ability as the participants in *Sample 1*. They were asked to rate on a five-point bipolar scale whether each description was more suitable for a typical person with high or low ability. The ability ratings for the two poles of each trait were averaged after the reversal of the scores of negatively-keyed poles.

***Sample 4: Social Desirability***

*Participants and procedure.* Eighty-seven Estonian-speaking students (31 men and 56 women, mean age  $22.8 \pm 14.9$  years) of the University of Tartu rated the levels

of social desirability of the S5 items. Analogously to Konstabel, Aavik, and Allik (2006) participants were asked to indicate, which answer options were socially most desirable. Ratings were made on a 7-point Likert scale ranging from *extremely undesirable* (-3) to *extremely desirable* (3).

## Results

Typical academically highly able women (*Sample 1*) were assessed significantly higher on E2:Gregariousness, E4:Activity, O2:Aesthetics, and C2:Order and lower on N4:Self-Consciousness compared with typical academically gifted men ( $p < .05$ ). In the case of low ability, women were judged significantly higher on N6:Vulnerability and A6:Tender-Mindedness than men ( $p < .05$ ). However, the Pearson correlations between the mean scores for typical men and women across all 30 personality traits were remarkably high:  $r = .99$  and  $.97$  (both  $p < .001$ ; for typical high and low ability people, respectively). We considered the possibility that the profile correlations were inflated by the overall keying of facets of Neuroticism in the socially undesirable direction and facets of the other four factors in the desirable direction. However, the correlations remained high even after the reversal of the neuroticism scale values, interpreting them in terms of emotional stability ( $r = .97$  and  $.95$ ,  $p < .001$ ). Thus, as men and women were generally perceived to have rather similar personality profiles we pooled the ratings of both sexes.

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 Insert Figure 1 about Here  
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Stereotypic personality profiles about academically more and less intelligent people are shown on Figure 1. For comparison, stereotypic personality profiles related to different levels of practical intelligence (*Sample 2*) are shown in the same figure. It

is easy to notice that the personalities of academically and practically more/less able persons were perceived rather similarly. Although the cross-sample differences in mean values were significant for six and nine facets (for typical persons with high and low intelligence, respectively), these differences were rather modest and did not remarkably change the shape of the profiles. Perceived personality profiles of academically and practically intelligent individuals were highly correlated ( $r = .97$ ,  $p < .001$ ). Likewise, profiles of typical persons with low academic and practical ability were highly similar ( $r = .89$ ,  $p < .001$ ). After reversal of Neuroticism scores the respective correlations were  $r = .93$  and  $.82$  ( $p < .001$ ). Thus, varying the conceptualisation of intelligence made no considerable difference in the portrayal of personality traits.

However, there were huge differences between the perceived personality traits of typical persons with high and low ability. The Pearson correlations between the profiles were  $r = -.91$  in *Sample 1* and  $r = -.90$  in *Sample 2* ( $p < .001$ ). After reversal of Neuroticism scores the respective correlations were still very high,  $r = -.87$  and  $-.81$  ( $p < .001$ ). In the ratings given for academically more and less able persons (*Sample 1*), mean level differences were statistically significant for 27 of the 30 facets (Table 1, column 1). Similarly, in the ratings given for practically more and less able persons (*Sample 2*), personality was perceived significantly differently in nearly all facets (Table 1, column 2).

Thus, according to these results, people tended to have very different personality stereotypes about more and less intelligent people. Furthermore, the stereotypes did not depend considerably on the domain in which intelligence was defined. In both conceptualisations of ability, the personality portrait of a typical less intelligent person was almost a perfect mirror image of the personality of a typical

highly intelligent individual. For this reason, we used the differences between the average ratings of typical high and low ability persons in further analyses (Cohen's *d*s, Table 1). The *d*-values characterize how typical each trait was considered for high-ability persons in comparison to low-ability persons.

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 Insert Table 1 about Here  
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Compared to previous experiments, participants of *Sample 3* had the opposite task: they were asked to rate the typical ability level of people corresponding to personality descriptions. The mean ability-ratings of the personality descriptions of *S5* are given in Table 1 (column 3). Mean values around zero mean that the traits tended to be attributed to persons with average ability. Negative mean values indicate that participants rated the traits as corresponding to low-ability persons and positive values indicate that the traits were associated with high intelligence. Results showed that all Neuroticism traits were attributed to a person with below average ability and all of the Extraversion, Openness, and Conscientiousness facets were associated with higher ability, although to differing degrees. With Agreeableness the results were mixed: three facet-level traits (A1:Trust, A2:Straightforwardness, and A3:Altruism) were attributed to people with slightly above-average ability, whereas A4:Compliance and A5:Modesty were considered to characterize individuals with below-average intelligence. A6:Tender-Mindedness was rated as most neutral with respect to intelligence.

The correlations between all three profiles concerning perceived personality-ability relationships (academic intelligence, practical intelligence, and typical ability ratings; Table 1, columns 1-3) were remarkably high, ranging from .88 to .93 (.77 to .89 after reversal of the neuroticism scale values;  $p < .001$ ). Thus, there was a strong

and robust implicit theory concerning the perceived relationships between intelligence and personality, regardless of the method of evaluation.

Is social desirability a covariate of the implicit theory about the relationships between intelligence and personality? First, to cross-validate the desirability ratings of the S5 scales (Table 1, column 4) we correlated these to the desirability scores of the NEO-PI-R facet scales obtained in a previous study (Konstabel, Aavik, & Allik, 2006). The correlation was as high as  $r = .94$  ( $p < .001$ ), providing evidence of validity. The social desirability ratings of the S5 were highly correlated to all personality profiles describing the perceived relationships between personality and ability. The correlations were  $r = .76$ ,  $.78$ , and  $.86$  ( $p < .001$ ), respectively with personality profiles related to academic and practical abilities and mean ability ratings of personality traits. After reversal of Neuroticism facets the correlations were somewhat lower, ranging from  $r = .42$  to  $.57$  ( $p < .05$ ). Thus, intelligent people were generally perceived to score high on those traits that were regarded as socially favorable and low on those traits that were seen as socially undesirable. However, Agreeableness was a remarkable exception. Although being trustful, straightforward, altruistic, and compliant was regarded as socially advantageous, it was not believed that these traits were necessarily possessed by intelligent people.

We formally tested the relative contribution of each facet scale to the overall correlation between the profiles of ability-related stereotypes and social desirability by decomposing the correlation coefficient into individual contributions made by each facet scale (Asendorpf, 1992). First, we made an aggregate profile of ability-related stereotype by averaging the three stereotypic profiles (Table 1, columns 1-3) and found its Pearson product moment correlation with social desirability ratings (Table 1, column 4). The correlation was highly significant ( $r = .83$ ,  $p < .001$ ). The contribution

of each facet scale to the overall correlation was computed as  $1 - [(z_1 - z_2)^2/2]$ , where  $z_1$  and  $z_2$  are the facet scores standardized across the full profile for stereotype and social desirability ratings, respectively. The mean of these individual contributions (Table 1, column 5) is equal to the Pearson product moment correlation between the profiles (.83). As expected, the smallest contributions to the overall correlation between ability stereotypes and social desirability ratings were made by three Agreeableness facets: A1:Trust (.46), A2:Straightforwardness (.46), and A3:Altruism (.44).

## **Discussion**

The results of this study indicate that the implicit theory concerning the relationship between personality and intelligence is robust: Across samples and methods of assessment, for both men and women, Neuroticism traits are strongly associated with low ability, whereas high scores on the facets of Extraversion, Openness, and Conscientiousness are attributed to persons with high ability. It remains, however, to be demonstrated whether these stereotypes are replicable in other cultures.

Which are the possible sources of this implicit theory (i.e. ability-related personality stereotypes)? It has been suggested that people develop an implicit theory concerning the covariation of personality traits by observing their real life covariation (McCrae, Jang, Livesley, Riemann, & Angleitner, 2001). However, this does not seem to be the case here because the psychometrically measured relationships between the two realms are weak and ambiguous (Eysenck, 1994). Numerous empirical studies have typically found no or only modest correlations between measures of psychometric intelligence and self- or other-rated personality traits (Ackerman &

Heggestad, 1997; Allik, Laidra, Realo, & Pullmann, 2004; Chamorro-Premuzic, Moutafi, & Furnham, 2005).

According to a classic definition, “a stereotype is an exaggerated belief associated with a category” (Allport, 1954, p. 191). Thus, even if the empirical correlations between personality traits and intelligence are small, stereotypes can still magnify them. In the implicit theory Neuroticism appeared to be negatively and Extraversion, Openness and Conscientiousness positively related to ability. Hence, with respect to the positive relationship between ability and Openness, the implicit theory appears to amplify the existing relationship. Although weak, the associations between psychometric ability and neurotic traits also tend to be negative (Ackerman & Heggestad, 1997; Chamorro-Premuzic et al., 2005). On the other hand, in contrast to implicit theory self-reported Extraversion appears to be unrelated to IQ (Ackerman & Heggestad, 1997; Allik et al., 2004). Furthermore, in case of Conscientiousness the implicit theory seems opposed to the empirical findings, because several studies have found that Conscientiousness or some of its facets correlate negatively with psychometrically measured ability (Allik & Realo, 1997; Moutafi, Furnham, & Crump, 2006; Moutafi, Furnham, & Paltiel, 2004). It is possible, of course, that participants equated ability with achievement. In this case, indeed, the implicit link between ability and Conscientiousness corresponds to empirical findings (Barrick & Mount, 1991). Nevertheless, although there may be a “kernel of truth” in the implicit theory, it does not seem to be based on empirically observed small personality differences between intellectually more and less talented individuals.

Another potential explanation for the implicit theory concerning the covariation of ability and the Big Five personality traits concerns social desirability. There was a considerable overlap between the personality description of typical intellectually

gifted persons and the levels of social desirability of the respective traits. Smart people were believed to behave in socially approved ways by being emotionally stable, outgoing, open, and dependable. In fact, it is an old suggestion that rated intelligence and personality traits are correlated due to some sort of halo-effect (Webb, 1915). However, there was a noticeable discrepancy. Although being agreeable with other people—trustful, straightforward, and altruistic—is regarded as socially highly appropriate, it is not believed that these traits are typical either of intellectually talented or less competent individuals.

There may be a tacit concept behind this relative neutrality of agreeableness. By attributing neutral agreeableness to high-IQ individuals, respondents may express the idea that it is not always advantageous to be kind to other people. In fact, being unselfish and sincere may sometimes work against doing well in life. Empirical data, too, suggests that being agreeable is not always adaptive or conducive to, for example, occupational career success. Several studies have demonstrated that low—not high—agreeableness is a predictor of career and commercial success (Seibert & Kraimer, 2001; Zhao & Seibert, 2006). Thus, the idea that smart (successful) individuals are not obligatorily trusting, straightforward and altruistic may be based on real life observations.



**Captions**

**Figure 1:** Mean profiles of typical high- and low-ability persons.

**Table 1:** Differences between typical high- and low-ability persons (Cohen's *ds*), means (standard deviations) of typical ability and social desirability ratings and an index showing the relationship between ability-related stereotype and social desirability at the level of facets.

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Table 1.

	1	2	3	4	5
	Academic Intelligence ( <i>d</i> -values)	Practical Intelligence ( <i>d</i> -values)	Ability Ratings (means and SDs)	Social Desirability Ratings (means and SDs)	Contribution s of facet scales <sup>1</sup>
N1:Anxiety	-1.09***	-1.17***	-1.43(1.39)	-3.43 (1.46)	0.88
N2:Angry Hostility	-1.80***	-1.29***	-1.64(1.49)	-4.07 (1.69)	0.90
N3:Depression	-1.11***	-1.31***	-1.94 (1.51)	-3.95 (1.55)	0.87
N4:Self-Consciousness	-1.65***	-1.74***	-1.89 (1.43)	-3.84 (1.57)	0.97
N5:Impulsiveness	-1.35***	-0.58***	-1.46 (1.33)	-2.68 (1.85)	0.96
N6:Vulnerability	-2.65***	-1.72***	-2.47 (1.11)	-4.39 (1.50)	1.00
E1:Warmth	0.17	0.47**	1.29 (1.53)	4.40 (1.40)	0.58
E2:Gregariousness	0.81***	1.32***	0.65 (1.35)	2.03 (1.66)	0.99
E3:Assertiveness	2.12***	1.71***	2.51 (1.32)	2.15 (1.82)	0.55
E4:Activity	2.16***	1.50***	1.22 (1.38)	2.15 (1.39)	0.82
E5:Excitement-Seeking	0.80***	0.81***	1.47 (1.43)	2.16 (1.81)	0.99
E6:Positive Emotion	0.76***	1.00***	0.51 (1.19)	2.77 (1.65)	0.97
O1:Fantasy	-1.05***	-1.77***	0.70 (1.34)	1.82 (1.72)	0.51
O2:Aesthetics	2.15***	0.76***	2.06 (1.61)	3.23 (2.18)	0.97
O3:Feelings	0.56***	0.39*	0.67 (1.55)	2.63 (2.15)	0.93
O4:Actions	1.96***	1.28***	1.72 (1.36)	2.70 (1.37)	0.91
O5:Ideas	2.28***	1.25***	2.36 (1.35)	2.60 (1.77)	0.77
O6:Values	0.55***	0.53***	0.64 (1.32)	1.51 (1.53)	1.00

ABILITY AND PERSONALITY STEREOTYPES

(Table 1 continued)

A1:Trust	-0.98***	-0.19	0.18 (1.45)	2.73 (1.96)	0.46
A2:Straightforwardness	0.04	0.35*	0.54 (1.47)	4.05 (1.63)	0.46
A3:Altruism	0.30**	0.31	0.36 (1.61)	4.13 (1.67)	0.44
A4:Compliance	-0.24*	-0.56**	0.22 (1.64)	2.17 (1.90)	0.64
A5:Modesty	-0.06	-0.46***	0.93 (1.57)	0.22 (1.88)	0.97
A6:Tender-Mindedness	0.49***	0.29	0.02 (1.29)	1.51 (1.64)	0.98
C1:Competence	3.86***	1.80***	2.95 (1.19)	4.03 (1.50)	0.65
C2:Order	1.92***	1.20***	1.57 (1.37)	3.56 (1.72)	1.00
C3:Dutifulness	1.82***	1.43***	1.48 (1.43)	4.09 (1.64)	0.99
C4:Achievement Striving	2.30***	1.64***	2.43 (1.30)	3.33 (1.61)	0.86
C5:Self-Discipline	2.76***	2.10***	2.28 (1.28)	4.10 (1.38)	0.90
C6:Deliberation	1.82***	0.70***	1.61 (1.40)	3.32 (1.28)	1.00

NOTE: Positive *d*-values show that typical high-ability person was rated higher on these traits; <sup>1</sup>Contributions of individual facet scales to the correlation between averaged stereotype profile (columns 1-3) and social desirability ratings (4), calculated using Asendorpf's (1992) formula.

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$