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Gender differences in the relationships between Big Five personality traits and intelligence

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Abstract

The article presents the results of the pilot study of the relationships between personality traits and intelligence in Russian boys and girls of high school age. We focused on the Big Five personality traits– Neuroticism, Extraversion, Openness to experience, Agreeableness and Conscientiousness –and the structure of their relationships with non-verbal intelligence measured with Raven's Standard Progressive Matrices. Significant correlations between Openness and intelligence were only found on the female sample. We revealed similarities and differences in the personality structures of boys and girls. The results are interpreted in the context of socio-cultural explanatory category.

*Keywords:*personality traits; Big Five; gender differences; intelligence.

1. Introduction

In recent year, there have been many studies on personality traits and its associations with intelligence (Harris et al., 1999), personality structure at different levels of intelligence (McLarnon & Carswell, 2013) and underlying mechanisms in the relationship of personality traits and intelligence (Chamorro-Premuzic, 2014).

According to studies, at least three of the Big Five personality traits – Openness to experience, Neuroticism, and Extraversion – are related to non-verbal intelligence (see review Malykh, Tikhomirova, 2015). Moreover, Openness to experience and Conscientiousness are often considered as correlates of cognitive abilities (Chamorro-Premuzic & Furnham, 2004).

On average, women show higher scores for Neuroticism than men (Costa et al., 2001). Smaller effect size was found for Extraversion. In particular, men show higher scores for the subscale Sensation Seeking (Weisberg et al.,

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2011). Studies have not reported any gender differences for Openness to experience and Conscientiousness (Costa et al., 2001). Gender differences in Agreeableness are consistently reproduced in studies with women scoring higher than men (Weisberg et al., 2011; Costa et al., 2001).

According to the studies, sex differences in intelligence are insignificant, but with a large variance in scores among men (Deary et al., 2007). Nevertheless, there is evidence that men show higher values of self-reported intelligence than women in different cultures (von Stumm et al., 2009). This fact can lead to sex differences in personality traits associated with the self-esteem in business proficiency (e.g., subscale Ideas in Openness), and to IQ test scores.

It should be noted that most of the results were obtained on samples from US and Western European cultures.At the same time, cross-cultural differences have been reported for some personality traits (e.g., Weisberg et al., 2011). It has also been shown that gender differences in personality traits are more pronounced in Western cultures with a minimum of gender role traditions (Costa et al., 2001; Schmitt et al., 2008). To our knowledge, there have been no studies of gender differences in the association between intelligence and personality traits on a Russian sample. The potential differences should be taken into account in the educational process.

Thus, in the current study we aimed to analyze the structure of the personality traits and their relationships with intelligence in terms of gender differences on the Russian sample.

2. Methods

2.1. Participants

In total, 147 Russian high school students participated in the study including 83 girls (56.5%) and 64 boys (43.5%; Mean age = 15.84, SD = 1.05).Data collection was conducted in educational institutions at the time of lessons strictly following the protocol under the constant supervision of a researcher.The analysis of the results was carried out on the basis of anonymous personal datawith prior written consent from the parents of the participants.

2.2. Measures

Non-verbal intelligence was measured using paper-and-pencil test 'Raven's Progressive Matrices'. It consists of 60 tasks grouped in 5 series.Each correct answer was counted as 1 score. Total scores were calculated.

To assess *personality traits* we used the Russian version of the questionnaire NEO-PI-R standardized on the Russian population. For the statistical analysis we used the scores for the five factors – Neuroticism, Extraversion, Openness to experience, Agreeableness and Conscientiousness.

3. Results

3.1. Descriptive statistics

Table 1 presents the descriptive statistics for the five factors – Neuroticism, Extraversion, Openness to experience, Agreeableness and Conscientiousness – and non-verbal intelligence.

Table 1. Means and standard deviations for the measures.

Factors/ Mean (SD)	Girls	Boys
Neuroticism	90.43 (15.00)	90.22 (13.45)
Extraversion	116.92 (19.38)	107.49 (19.68)
Openness to experience	110.64 (12.78)	99.90 (13.80)
Agreeableness	106.77 (16.28)	104.14 (11.49)
Conscientiousness	113.78 (19.44)	109.94 (15.53)
Non-verbal intelligence	43.18 (11.29)	41.49 (11.72)