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**Original Research Paper**

# Relationship between Personality Traits and Intelligence among Youth

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**ABSTRACT**

Present study examines the relationship between personality traits and intelligence. Further, find gender differences in personality traits and intelligence. The sample consists of 275 youth (141 boys and 133 girls) with the age range of 17 to 28 years (mean age 21.66 ± 2.47). Participants completed the NEO Personality Inventory and Raven's Standard Progressive Matrices. The results showed that personality traits such as neuroticism, agreeableness and extraversion have significant relationships with intelligence. Furthermore, results showed that girls were higher on neuroticism and extraversion in comparison to boys. Implications, limitations of the study and suggestions for future research are also discussed.

***Keywords:*** *Personality traits, intelligence and gender differences*

Intelligence and personality are enduring and stable traits across situations and over time. They show substantial contributions of genetic factors to individual differences. Personality and intelligence are considered separate constructs (Maltby, Day, & Macaskill, 2007). The few studies that attempted to link them reported modest correlations. There are interesting hypotheses about how the two domains are conceptually and empirically related (Furnham, Moutafi, & Chamorro-Premuzic, 2005; Goff & Ackerman, 1992). Intelligence has been viewed as the cognitive part of the construct of personality (Brody, 1992; Cattell, 1941; Eysenck, 1997). Wechsler (1950) considered intelligence to be a manifestation of personality as a whole and argued that certain affective and motivational factors are integral parts of the construct of intelligence.

In the area of personality structure, current researchers (De-Raad, 1996; Digman, 1990; Furnham, 1996, 1997; Busato, Prins, Elshout, & Hamaker, 2000) have agreed on the psychometric advantages of the Big Five Model proposed by McCrae and Costa (1987). Most of

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the recent literature which deals with the main personality correlates of psychometric intelligence has focused on the relationship between intelligence test scores and the Big Five personality traits (Brand, 1994), although there is an earlier literature looking at other personality traits.

Most studies report low and non-significant correlations between personality traits and psychometric intelligence test scores (Moutafi, Furnham, & Crump, 2003). However, research has suggested that personality traits may have more important distal, rather than primal, role effects. Further, there is increasing evidence that personality and intelligence are good predictors for academic performance (Chamorro-Premuzic & Furnham, 2003a, b; 2004; Chamorro-Premuzic, Furnham, & Moutafi, 2004; Furnham, Chamorro-Premuzic, & McDougall, 2003). Thus Furnham (2001) suggested that personality variables influence test-taking style, which in turn influences intelligence test scores and which therefore may not reflect true latent scores.

Several dimensional models have been suggested for personality. The five factor model (FFM) distinguishes five domains of personality: neuroticism, openness to experience, conscientiousness agreeableness and extraversion, (Costa & McCrae, 1992). These traits show heritabilities from 30% to 60%, with openness to experience and extraversion commonly being the most heritable (Bouchard & Loehlin, 2001; Distel et al., 2009; Rettew, Rebollo-Mesa, Hudziak, Willemsen, & Boomsma, 2008).

Some studies reported negative associations between IQ and neuroticism (Austin, Hofer, Deary, & Eber, 2000; Kyllonen, 1997). Openness to experience tends to correlate highest with intelligence (Ackerman & Heggestad, 1997; Aitken Harris, 2004; Chamorro-Premuzic, Moutafi, & Furnham, 2005; Moutafi, Furnham, & Crump, 2006) and is associated with a wide class of intellectually oriented traits, such as curiosity, creativity, and willingness to explore new ideas (Goldberg, 1993). Results for other personality traits are less clear. Correlations of intelligence with conscientiousness have been small and negative (Furnhamet al., 2005). Moutafi et al. (2006) hypothesized that conscientiousness is a trait that less intelligent individuals can possess to compensate in a competitive environment. Conscientiousness, in contrast, has been positively associated with academic performance (Chamorro-Premuzic & Furnham, 2003; Lievens et al., 2002). Agreeable people tend to be pleasant and accommodating in social situations and this trait is rarely associated with intelligence. However, one study found a small positive relation with scholastic achievement in adolescent males (Peterson, Pihl, Higgins, Seguin, & Tremblay, 2003). Altruistic behavior, which is a small aspect of the construct of agreeableness, was associated with higher IQ scores in younger children (Kohlberg, 1964; Krebs & Sturrup, 1982). Occasionally, extraversion has been reported to correlate (positively and negatively) with intelligence (Wolf & Ackerman, 2005), and this relation has been moderated by the nature of the test and the context (Bates & Rock, 2004; Matthews, 1997; Rawlings & Carnie, 1989; Robinson, 1985).

Reported sex differences in psychometric intelligence have sparked heated debates (Irwing & Lynn, 2005; Nyborg, 2005; Lawrence, 2006). However, sex differences on other psychological constructs—specifically, personality and self-estimated intelligence—are widely acknowledged (Hogan, 1978; Beloff, 1992; Ackerman & Rolfhus, 1999; Costa, Terracciano, & McCrae, 2001; Neto, Ruiz, & Furnham, 2008; Schmitt, Realo, Voracek, & Allik, 2008; Furnham, von Stumm, Makendrayogam, & Chamorro-Premuzic, 2009).

From the early years of the twentieth century it has been consistently asserted that there is no sex difference in average general intelligence defined as the sum of cognitive abilities measured by the IQ obtained in tests like the Wechslers and the Binets. This consensus was broken by Lynn (1994, 1999) who contended that while it is correct that there is virtually no sex difference in average intelligence between the ages of 5 and 15 years, from the age of 16 years males begin to have greater average intelligence than females and that this increases to an advantage of between 4 and 5 IQ points in adults. More specifically, Lynn (1994) proposed that there is virtually no sex difference in intelligence between the ages of 5–10 years, that between the ages of 11–14 years girls have a small IQ advantage of approximately 1IQ point because they mature earlier, and that from the age of 15–16 years boys develop a small IQ advantage of approximately 1 IQ point, which increases in later adolescence to reach approximately 4 IQ points among adults. Lynn and Irwing (2004) published a meta-analysis of 57 studies of sex differences on the Progressive Matrices in which they showed that there is no difference among children aged 6–14 years, but that males obtain higher means from the age of 15 through to old age, and that among adults, the male advantage is 5 IQ points. A year later Irwing and Lynn (2005) published a meta-analysis of 22 studies of sex differences on the Progressive Matrices in university students and concluded that in these samples males have an advantage of 4.6 IQ points. Furthermore, Ali, Suliman, Kareem, Iqbal (2009) studied gender differences in scores on a structured, standard, robust test of intellectual ability in 150 students (75 male and 75 female) and found that the male students as a group, scored higher than the female students as a group, the difference was small but statistically significant.

Thus, the current study determines the prevalence of personality traits and intelligence. Also examines the relationship between personality traits and intelligence. Further, it also extends the line of research by looking for gender differences in personality traits and intelligence.

***Objectives***

1. To explore the prevalence of personality traits as well as intelligence among youth.
2. To explore the relationship between personality traits and intelligence among youth.
3. To investigate the gender difference in personality traits as well as intelligence among youth.

***Hypotheses***

1. There would be a significant correlation between personality traits and intelligence among youth.
2. There would be significant gender difference in personality traits and intelligence among youth.

## METHODOLOGY

***Sample***

The study includes 274 subjects with the age range of 17 to 28 (mean age 21.66 ± 2.47) out of which 141 (51.27%) were boys and 133 (48.73%) were girls.

***Tools***

1. The NEO Personality Inventory (NEO-FFI; Costa & McCrae, 1992). Personality traits were measured by the short version of the NEO (NEO-FFI: Costa & McCrae, 1992). The NEO-FFI consists of 60 items that are rated on a five point scale (1–5: totally disagree, disagree, neutral, agree and totally agree) and gives a score for the traits neuroticism, agreeableness, conscientiousness, extraversion and openness to experience. For each trait 12 items are summed to obtain a total score.
2. Raven's Standard Progressive Matrices (SPM; Raven, 1981) was used to measure participants' intellectual abilities. The SPM is a measure of pure non-verbal reasoning ability that is relatively independent of specific learning acquired in a particular cultural or educational context (Jensen, 1998). The SPM is made up of a series of designs with a part missing and those taking the test are expected to select the correct part to complete the designs from a number of options printed beneath (Raven, 2000). Consisting of 5 sets of 12 different matrices gradually increasing in difficulty, the test can be used for a wide age range. The SPM was standardized in Estonia on the same two samples (Lynn, Allik, Pullmann, & Laidra, 2002; Lynn, Pullmann, & Allik, 2003). The internal reliabilities of the SPM ranged from .82 to .88 for the grade levels that were tested

***Procedure***

The aforesaid psychometric measures were handed over to those who volunteered to participate in the study. The participants were requested to give answers honestly and they were ensured of the confidentiality of their responses. Instructions related to each scale were clearly explained to each participant before the actual administration of the said scales and their queries (if any) were attended appropriately. In addition to it, each participant was requested to ensure that they have responded to all items of scales. There was no restriction of time for the completion of scales. In the end, participants were thanked for their voluntary participation. After the collection of scales from the participants, responses were scored according to manual.

## RESULTS

Descriptive statistics, correlation analysis and Independent sample 't' test were used to describe the variables from the data from this study.

***Table 1: Descriptive findings for Personality traits and Intelligence variables***

| Variable | Mean | S.D | N | % |
|---|---|---|---|---|
| Personality traits | | | | |
| Neuroticism | 26.09 | 9.03 | 275 | |
| Low (Scores 1 - 14) | | | 24 | 8.73 |
| Medium (Scores 15 -31) | | | 192 | 69.82 |
| High (Scores 32 - 48) | | | 59 | 21.45 |
| Openness | 26.07 | 8.65 | 275 | |
| Low (Scores 1 - 23) | | | 78 | 28.36 |
| Medium (Scores 24 -32) | | | 153 | 55.64 |
| High (Scores 33 - 48) | | | 44 | 16 |
| Conscientiousness | 28.84 | 5.02 | 275 | |
| Low (Scores 1 - 26) | | | 68 | 24.73 |
| Medium (Scores 27 -39) | | | 198 | 72 |
| High (Scores 40 - 48) | | | 9 | 3.27 |
| Agreeableness | 27.79 | 7.58 | 275 | |
| Low (Scores 1 - 26) | | | 109 | 39.64 |
| Medium (Scores 27 -37) | | | 137 | 49.82 |
| High (Scores 38 - 48) | | | 29 | 10.54 |
| Extraversion | 30.37 | 6.02 | 275 | |
| Low (Scores 1 - 21) | | | 16 | 5.82 |
| Medium (Scores 22 -32) | | | 169 | 61.45 |
| High (Scores 33 - 48) | | | 90 | 32.73 |
| Intelligence (I.Q) | | | | |
| Intelligence | 46.92 | 8.47 | 275 | |
| Low (Scores 0 - 39) | | | 45 | 16.36 |
| Medium (Scores 40 -46) | | | 64 | 23.27 |
| High (Scores 47 & above) | | | 166 | 60.37 |

As shown in Table 1 based on the mean of actual scores of respondents, the scores of Personality traits shows that on neuroticism 21.45% of the respondents reported high score. On Openness 16% of the respondents reported high score. On Conscientiousness 3.27% of the respondents reported high score. On Agreeableness 10.54% of the respondents reported high score. On Extraversion 32.73% of the respondents reported high score. The score of Intelligence shows that on Intelligence 60.37% of the respondents reported high score.

***Table 2: Correlation Matrix for Personality traits and Intelligence***

| Variable | Neuroticism | Openness | Conscientiousness | Agreeableness | Extraversion | Intelligence |
|---|---|---|---|---|---|---|
| Neuroticism | 1 | -.11 | -.11 | -.24** | -.44** | -.17** |
| Openness | | 1 | .07 | -.03 | .01 | .09 |
| Conscientiousness | | | 1 | .11 | .21** | .03 |
| Agreeableness | | | | 1 | .22** | .14* |
| Extraversion | | | | | 1 | .16** |
| Intelligence | | | | | | 1 |

***p<0.01, *p<.05*

As indicated in Table 2, three dimensions of five personality traits statistically have significant relationships with intelligence. Personality trait's significant dimensions include neuroticism, agreeableness and extraversion. The finding from the study showed that there was a significant negative correlation between neuroticism and intelligence ( r=-.17, p<.01). While there was a significant positive correlation between agreeableness and intelligence ( r=-.14, p<.05) and between extroversion and intelligence ( r=-.16, p<.01). Furthermore, openness to experience and conscientiousness dimensions did not have significant correlation with intelligence. Hence, the first hypothesis that "there would be a significant correlation between personality traits and intelligence" has been partially proved.

***Table 3: Gender Differences in Personality traits and Intelligence***

| **Variable** | **Boys (N=141)** | | **Girls (N=133)** | | **t-values** |
|---|---|---|---|---|---|
| | **Mean** | **S.D** | **Mean** | **S.D** | |
| Neuroticism | 24.74 | 8.58 | 27.59 | 9.28 | 2.64** |
| Openness | 26.06 | 9.33 | 25.98 | 7.86 | .07 |
| Conscientiousness | 28.71 | 5.37 | 28.94 | 4.63 | .38 |
| Agreeableness | 27.99 | 7.54 | 27.47 | 7.53 | .57 |
| Extraversion | 28.66 | 5.57 | 32.11 | 5.93 | 4.96** |
| Intelligence | 46.49 | 8.63 | 47.37 | 8.34 | .86 |

***p<0.01*

Table 3 shows mean differences and standard deviations for boys and girls on the personality traits and intelligence, which showed that girls had significantly higher on personality traits of neuroticism ( t=2.64, p<.01) and extraversion ( t=4.96, p<.01), but there were no substantial gender differences for intelligence. Hence the second hypothesis that "there would be significant gender difference in personality traits and intelligence" has been partially proved.

## DISCUSSION

The present study was conducted to investigate the relationship between personality traits and intelligence among youth. The findings of the current study reveal that high percentage of students fall in the average category of neuroticism as compared to high and low category of

neuroticism, which shows that today's students are average tensed and have average patience in their lives. They show average emotional reactions whenever confronted with stressful situations. High percentage of students fall in the average category of openness to experience shows that they have average level of wide interests, being imaginative, insightful, attentiveness to inner feelings, preference for variety, intellectual curiosity, tend to be politically liberal and tolerant of diversity. High percentage of students fall in the average category of openness to experience shows that they are the people with average level of reliable, motivated and hard working. High percentage of students fall in the average category of agreeableness shows that they have average level of empathetic, considerate, friendly, generous, and helpful and they also have an optimistic view of human nature. They tend to believe that most people are honest, decent, and trustworthy and less likely to suffer from social rejection. High percentage of students fall in the average category of extraversion shows that they have average level of traits such as talkative, energetic, gregarious, assertiveness, outgoing, comfortable around people, and start conversations. High percentage of students falls in the high category of intelligence which shows that they are more intelligent. They have increase confidence and motivation and in turn performance.

Looking at the trend of the correlation between personality traits and intelligence, it was found that neuroticism, agreeableness and extraversion have significant relationships with intelligence. It indicates that respondents with a low score in neuroticism had high intelligence. On the other hand, respondents with high score on agreeableness and extroversion have high intelligence. Previous research suggests that neuroticism was associated with lower self-estimated intelligence (Furnham & Thomas, 2004). In prior studies (Furnham, et al., 2001, 2005; Chamorro-Premuzic & Arteche, 2008), neuroticism was negatively associated with self-estimated intelligence, whereby neurotic individuals endorse a poor self-concept and, consequently, award themselves lower estimates of intelligence. Self-estimated intelligence found to be positively related to extraversion and agreeableness (Furnham, Kidwai, & Thomas, 2001; Chamorro-Premuzic, Moutafi, & Furnham, 2005). Agreeable people tend to be pleasant and accommodating in social situations and this trait is rarely associated with intelligence. Altruistic behavior, which is a small aspect of the construct of agreeableness, was associated with higher IQ scores in younger children (Kohlberg, 1964; Krebs & Sturrup, 1982). In another study higher intelligence was observed among those scoring higher on extraversion may result from their inherent overconfidence and assertiveness (Furnham, Moutafi, & Chamorro-Premuzic, 2005). Further, previous research suggest that the self-confidence associated with Extraversion was positively associated with self-estimated intelligence (Furnham & Thomas, 2004; Furnham, Kidwai, & Thomas, 2001)

Results reveal that girls scored significantly higher on neuroticism and extraversion in comparison to boys; however, no substantial gender differences were observed on openness, conscientiousness and agreeableness. However, no gender difference was observed on

intelligence. The results are consistent with the findings of Feingold (1994), Costa et al., (2001) which shows that women tend to score higher than men on extraversion. Empirical evidence shows that in comparison to men, women generally score higher on neuroticism and agreeableness (Feingold, 1994; Costa, et al., 2001). In prior studies, Colom et al., (2000) found negligible sex difference in general intelligence. Ankey (1992) also accepts the view that there is no sex difference in IQ and that females obtain higher means on verbal abilities, while males obtain higher means on spatial abilities (Hyde & Linn, 1988; Linn & Petersen, 1985; Voyer, Voyer, & Bryden, 1995).

## CONCLUSION

Based on findings of this study, it was found that personality traits such as: neuroticism, agreeableness and extraversion have significant relationships with intelligence. It is clear to note that people who are less neurotic, more agreeable and more extraversion are more likely to have higher intelligence. Girls were higher on neuroticism and extraversion in comparison to boys.

In conclusion, the results from this study showed that personality traits play a vital role to determine the level of intelligence. Thus, it is necessary that college/university students should be equipped with appropriate abilities, skills and knowledge so that they can have better adjustment with their society at large.

### *Implications of the study*

The findings of this study may be beneficial for educational psychologists, counselors, school psychologists, teachers, parents, administrators and policy makers to keep these findings under consideration while taking some steps or planning ahead. These findings can help teachers to develop some strategies in order to encourage and facilitate the intelligence of students. It can help administrators to develop some plans for devising a stress free and healthy environment so that students can develop a healthy personality. Furthermore, the Government should specify some funds in order to boost up the intellectual level of individuals in different settings.

This would improve our understanding of individual differences in both personality and intelligence. The study has thus clinical, educational, and organizational relevance: knowing how intelligent people think they are, and why, and whether they can become more so should not be considered less important than knowing how intelligent people actually are. The findings attest to the possible value of giving people feedback on both their intelligence and personality traits scores along with population norms. However, this would probably be of greater personal advantage to high rather than low scorers, but this also depends on their beliefs about the possible change to their actual intelligence.

### *Limitations and Recommendations*

In the present study, socioeconomic status of the students was not controlled which might have contributed in personality traits and intelligence of students. Self reported tools have been used

in the current study. In order to get more externally valid results, researchers can replicate the present study on a large and more diverse sample. More than one university of different cities can be taken to get more information. Longitudinal study can be fruitful to know the change in intelligence, neuroticism and extraversion with the passage of time. Effect of change in educational level can be seen on the variables of the study.

More research needs to be carried out into the other possible factors as discussed above, which could explain this interesting phenomenon. Future research studies in this subject need to include many more possible variables, since multiple influences may be acting in confluence to give rise to this difference. Furthermore, the sample size in future studies would have to be larger to arrive at more robust results.

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