

Study of Relationship between Academic Scores and Personality Traits and Intelligence Scores of Volunteers Participated in Iran Oil Refining and Distribution Company Employment Test Considering Demographic Variables

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ABSTRACT

This survey was conducted to study the relationship between academic scores, personality traits and intelligence scores of volunteers participated in Oil Refining and Distribution Company employment test considering demographic variables. It is a descriptive and correlation type of research. This survey was conducted on 47158 individuals took part in recruitment test of this organization as an available sample. To assess the personality characteristics of NEO-Personality Inventory (Costa & McCrea, 1987) with a reliability of 0.94 and to assess the intelligence, a researcher-made intelligence test with an approved reliability and validity (Cronbach's alpha, 0.89) was used. The data was analyzed using statistical descriptive and inferential methods. The findings showed that there is a positive and significant relationship between academic scores and the scores of all NEO factors except neuroticism. In addition, the findings showed that there is a significant and positive relationship between the scores of intelligence and all of NEO factors except neuroticism at all of the levels and there is a negative significant relationship between neuroticism and intelligence as well ($p < 0.05$). The findings associated with the comparison of variables through separating demographic variables showed that generally the males' intelligence is higher than the females and the scientific (academic) score of females is higher than the males and in total NEO factors, the scores of males are lower than the females.

KEYWORDS: NEO Personality Questionnaire, intelligence scores, scientific scores

1. INTRODUCTION

Personality is defined as the traits predictable to some extent influencing the passions, cognitions and patterns of human's behavior [1]. The models related to Five Factor Model (FFM) of personality have received much support during the past decades [2]. This matter caused that a variety of tools have been made in order to assess these five factors models of personality. One of these tools is NEO-Personality Inventory [3]. Some of the research has shown that the main dimensions of this inventory are universal found in different cultures [4]. The validity of this inventory has been studied and approved in virtual space as a tool for assessing the personality traits [5]. In fact, big five factors pattern involves five relatively stable factors of personality that is able to identify the personal differences of individuals over these five major traits to some extent [6]. One of the most applied self-assessment tests of personality are Neo family of tests formed based on the theory of five factors of personality [8].

These five factors are as the following: Neuroticism, Extraversion, Openness to experience, Agreeableness, and Conscientiousness. In cross-cultural surveys conducted on this inventory, different results have been obtained in which the personality structures traits are consistence and corresponding to each other in some assessments and comparisons [7], but not in some of the other assessments [8].

The results of factor analysis in different internal surveys show that the Iranian sample had higher scores than the American sample on neuroticism scale and lower scores on agreeableness and openness to experience. A variety of research has studied the relationship of these five big traits of personality with the variables such as age [9], gender [10], learning approaches [11], temperament dimensions and achievement goals [12]. For example; it was identified in the research that the females are significantly higher than the males on two factors of agreeableness and conscientiousness [13].

Moreover, the findings of research conducted to study the personality differences based on the age and gender showed that the traits such as agreeableness, conscientiousness and openness to experience are observed in the females at lower ages than the males and these traits are increased in both of them from 16 to 20 years old [14].

The recent research has found a significant relationship between five big traits of personality and the employees' behaviors at workplace. For example; it was shown that agreeableness, neuroticism and openness to experience traits have

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strong significant relationships with the behaviors such as positive self-expression, lying and modifying behaviors at workplace [15]. Of course, it should be considered that this inventory is applied to the individuals higher than 17 years old but not to the ones with psychosis and dementia disorders, because these moods may influence their abilities to fill the desired form[16].

According to some personality theories, the personality of individuals clarifies their performance. For an instance; educational efficiency has a close relationship with personal traits so that openness to experience and conscientiousness (sense of duty) personality traits have a positive significant relationship with the educational achievement[17]. In addition, personality traits and cognitive abilities can predict behavioral, mental and occupational conditions of individuals in adulthood [18].

Based on the findings of recent research, personality tests play an important role in pre-employment processes. In the research conducted on the individuals' personal differences concerning faking and purposefully distorting, the findings showed that these traits have significant relationships with personality traits such as agreeableness and conscientiousness. As faking behaviors are regarded as counter-productive behaviors at workplace, detection of these behaviors in employment applicants is important [19]. In addition, utilizing the tests such as NEO-five big personality traits inventory to employment may result in more gender variety at different workplaces and occupational positions [20].

Utilizing psychological tests for selecting and employing the staff has remained as an ambiguous issue challenged the researchers and the staff hard. The arguments concerning the usage of cognitive tests and the opponent groups of these tests usage still continue without any certain response [21]. At the present, in most of the organizations recruitment tests in Iran the scientific scores are used as the criteria for staff selection. Therefore, one of the aims of this research is to study the relationship of psychological variables (intelligence and personality) with these scientific scores so that if there is no significant relationship, the necessity of applying psychological together with scientific scores will be regarded.

We hypothesized that:

H1. Academic Scores will be related to Personality Traits.

H2. Intelligence Scores will be related to Personality Traits.

H3. Intelligence Scores will be related to Academic Scores.

H4. There is significant difference between male and female in Intelligence Scores, Personality Traits and their relationship.

2. METHODS AND MATERIALS

To collect the data of this survey and in simultaneous with holding the employment test of Oil Refining and Distribution Company of Tehran, a form related to NEO Personality Questionnaire and intelligence test together with an employment test manual including Academic questions and a questionnaire related to demographic variables coordinated with human resources management department of Oil Refining and Distribution Company were given to the employment applicants. To analyze the data, two descriptive and inferential statistics methods were used. In inferential phase of the data analysis, a simple correlation was reported.

In addition, to study the hypotheses t-test for two independent samples, one-way variance analysis and Pearson correlation were used. In this survey, the sample was used as an available sample. Of course, it was possible that the sampling to be done randomly (among all of the participants, some of them may be selected randomly), as this method seems to be suitable for the research purpose and objectives). But, in this survey the specifying and applying purposes were more important for the organization. For this reason, being available of the information and responses related to the total employment applicants (participants of organization employment test), the data related to the total 47158 participants of employment test was utilized.

In this survey, short form of the NEO personality inventory (60 sentences) was used[9]. In this survey, Cronbach's alpha on NEO personality inventory was obtained to be 0.94 indicating an appropriate reliability. Intelligence and talent test was one of the other tools utilized in this research made by a researcher and its reliability and validity were approved through assessing and measuring of the pilot sample. This Pilot test contains 20 questions and its Cronbach's alpha was estimated to be 0.89 that is appropriate from statistical considerations.

In order to determine the validity of the present test, the method of factor analysis has been used. The value of Kaiser-Meiner-Olkin (K.M.O) obtained was 0.84.

Therefore, it may be concluded that performing factor analysis based on the resulting correlation matrix in under study sample group is interpretable and the questionnaire questions highly measure the desired factor. Another part of the tools collecting the data in this survey was the questions related to the scientific scores. These questions were designed by the education department of Oil Refining and Distribution Company of Tehran and utilized for the procedure of employment tests of this organization.

3. RESULT

Table 1 shows mean and standard deviation of Intelligent and Academic Scores with Considering Gender

Table 1: mean and standard deviation of Intelligent and Academic Scores with Considering Gender

Standard Deviation	Mean	Gender	
0.15	0.54	Female	Intelligence score
0.16	0.55	Male	
11/16	18/023	Female	Academic Score
12/77	17/84	Male	

As it was mentioned the mean of intelligence scores of males is higher than the females and the mean of Academic scores of females is higher than the males.

Table 2: the mean and standard deviation on NEO scores by gender separation

Standard Deviation	Mean	Gender	
0.46	2/11	Female	Neuroticism
0.49	2/058	Male	
0.49	3/34	Female	Extraversion
0.59	3/28	Male	
0.46	3/ 24	Female	Openness to experience
0.55	3/11	Male	
0.49	3/59	Female	Agreeableness
0.61	3/49	Male	
0.57	3/83	Female	Conscientiousness
0.70	3/73	Male	

*P<0.001

As shown, the mean of the females NEO Personality scores in all of the five factors is more than the males.

Table3: Relationship between Academic Scores with Personality Traits and Intelligence Scores

Conscientiousness	Agreeableness	Openness to experience	Extraversion	Neuroticism	Academic Score		
0.027	0.046	0.07	0.032	-0.02	1	Pearson correlation	Academic Score
<0/001	<0/001	<0/001	<0/001	<0/001	---	P<0.001	
0.085	0.109	0.141	0.94	-0/044	0.19	Pearson correlation	Intelligence score
<0/001	<0/001	<0/001	<0/001	<0/001	<0/001	P<0.001	

It is observed in this table that the NEO factors have significant relationships with the total academic score and the type of this relationship for the factors is positive except neuroticism factor. The relationship of NEO inventory factors scores with intelligence score is also similar to the relationship of the academic score.

Table4: Relationship between Academic Scores with Personality Traits and Intelligence Scores by gender separation

Intelligence score	C ⁵	A ⁴	O ³	E ²	N ¹			Gender
0.298	0.077	0.06	0.102	0.093	-0/026	Pearson correlation	Academic Score	Female
<0/001	<0/001	0.002	<0/001	<0/001	0.174	P<0.001		
1	0.072	0.085	0.095	0.097	-0/073	Pearson correlation	Intelligence score	Male
	<0/001	<0/001	<0/001	<0/001	<0/001	P<0.001		
0.215	0.047	0.060	0.081	0.056	-0/007	Pearson correlation	Academic Score	Male
<0/001	<0/001	<0/001	<0/001	<0/001	0.393	P<0.001		
1	0.049	0.068	0.083	0.065	-0/042	Pearson correlation	Intelligence score	Male
---	<0/001	<0/001	<0/001	<0/001	<0/001	P<0.001		

¹. Neuroticism, ² Extraversion, ³. Openness to experience, ⁴. Agreeableness, ⁵ Conscientiousness

As observed, type of intelligence and academic scores relationship with NEO factors at both sexes is similar (there is a positive significant relationship between the intelligence and academic score and the whole NEO inventory factors except neuroticism factor. Neuroticism factor has a negative significant relationship with intelligence and academic score).

4. DISCUSSION

The findings showed that in general the mean of NEO scores of males in each of five factors is lower than the females. In some research the results showed that the female students have obtained higher scores on neuroticism and agreeableness factors compared to the male students and also the male students obtained higher scores on extraversion, openness to experience, and conscientiousness compared to the female students. In addition, the resulted findings in different studies concerning gender differences have been inconsistency on extraversion, and openness to experience. For example; In a comprehensive research, the scores of females compared to the males on neuroticism and agreeableness were 0.51 and 0.59 at higher standard deviation, respectively [22].

In studying gender difference pattern in personality traits, Costa, Terracciano and McCrea showed that while the males get higher scores in some of the dimensions of openness to experience factor such as new beliefs acceptance, in contrary, the females get higher scores in dimensions of aesthetics acceptance and feelings than openness to experience factor. One of the reasons of higher neuroticism in females than the males is higher experience of negative passions in females caused by the distress and social constraints for the females. The females usually show more emotional and affective reactions in distress situations while the males have more control over their emotions and affections. Also, the females affected by gender bias in the society may have lower self-confidence and self-reliance. These constraints and distresses are observed more for the females especially at workplaces and at the conditions associated with employment [23].

In this research, the females have also obtained higher scores on agreeableness than the males. It is obvious that this conclusion is consistent with many of the other research findings due to the gender roles of the females in the society. Initially, the males have been encouraged for having the traits such as sacrifice and forgiveness and intimacy. Although these traits are appropriate and desire in some conditions, they cause that the females ignore their interests in some cases and sacrifice it for the interests, success and happiness of the other person, while the males have been encouraged initially to attempt hard for possession and success and express their beliefs and disagreements easily [24].

The results of this survey showed that the mean of intelligence scores in males is higher than the females and the mean of scientific scores of females is higher than the males. Much research has shown that there is a difference between the intelligence in males and females. To clarify gender differences in intelligence, physiological and sociological theories have been stated. Physiological theories study the differences in genes, hormones, and cerebral structure fields. Sociological theories consider developmental mechanisms, bringing up the children related to gender and gender roles and peers pressure [24].

Some research has shown that the general intelligence gain of males is a little higher than the females. On the other hand, much of the research has shown that this difference is related to the variety in different abilities so that in some of the mental dimensions, the males get higher scores and in the other dimensions the females. Therefore, it is possible that the intelligence assessment tests may have a type of unwanted bias toward the females so that in intelligence tests the skills like spatial-visual ability, mental imagination and calculations are important that according to the research done the males are better than the females in these abilities. On the other hand, the females are better than the males in verbal and oral skills considered as an element of mental and intelligence abilities [25]. But, these abilities are usually ignored in intelligence assessment tests and maybe it is why these tests estimate the female's intelligence lower than the males'. Therefore, there is a difference on the abilities of both sexes other than their general intelligence. This difference may have a bio cause and be generated due to the difference in brain structure and hormones and genes. But, the main cause of these differences is the difference in the manner of getting social of the females and males in environment meaning that the type of activities done by the males and females is important in growing their specific abilities. The females initially do the activities based on their gender roles enhancing special skills in them (communication and verbal ability) while the males initially promote their spatial imagination power and abstract thought by practical activities. This matter causes the differences in mental abilities of both sexes. Moreover, the females have a stronger memory and are able to save lots of subjects with no rational relations in their mind [25].

This ability causes that the female have more ability than the males in scientific tests associated with memory. The results of this survey showed that total factors of NEO inventory have significant relationship with total academic score and the type of this relationship is positive on all factors except neuroticism. The role of personality traits in clarifying study performance of individuals has been considered in much research. In this regard, in spite of much research about the role of intelligence tests and ability for predicting academic performance [11], lots of recent surveys have stressed that personality traits play important role in predicting academic performance. These surveys showed that the direct effect of five big factors of personality) on the performance was obtained [26]. Much research has shown that neuroticism factor has a negative significant relationship with academic performance while the other factors of NEO inventory have a positive significant relationship with the scientific scores of individual's. These researchers found that high stress and tension may cause the reduced academic performance and scientific scores of individuals. Also, one of the subscales of neuroticism is high stress and tension. Individuals with neuroticism are more influenced by the conditions and show a weaker performance [22].

We found that intelligence score has significant positive relationship with all of personality five factors except neuroticism also; the intelligence score has a positive significant relationship with academic score. Lots of research has been observed evaluating the relationship of big five factors of personality and emotional intelligence but, no research was found on direct relationship between general intelligence and personality traits by the researcher. Therefore, it seems that these two

variables have no relationship directly and other factors are involving that can clarify the relationship between these two variables. For example; the people with lower intelligence, usually have low self-confidence and assess themselves negatively and more likely to have a higher neuroticism. Extraversion has positive relationship with intelligence because one of the intelligence dimensions regarding multiple intelligence theory of Gardner is verbal and communicative skills. In addition, more intelligent people get a higher self-esteem because they have achieved more successes and this matter causes that they communicate rapidly and have more tendency and movement in order to do different activities and to get new experiences and they can get higher scores in openness to experience factor [27].

Different research has shown that the development of any organization fairly depends on correct use of human power. On the other hand, personality traits have high impact on the people performance, so managers and organizations should know that to select the persons and to put them in different job positions, personal traits of them should be regarded. Moreover, employment tests utilized in employment processes do not give enough information to the authorities of employment. Although these scientific scores showed a significant relationship with personality traits and intelligence in some groups, this relationship is not so strong that ignores psychological tests. Also In order to assess the intelligence, it is better to design and apply some tests that are based on the abilities of both males and females.

In this case, Difference between intelligence score of these two groups will be a real difference not based on gender biases. Maybe, applying more tests in employment process is time taking and high cost, but the managers should not look at this issue only from the view of cost, they should consider their resulted usefulness. The information obtained from these tests can be a supplementary to the conventional scientific tests and put a more complete profile in the hand of employment applicants. If selection decisions are made correctly and based on more complete information, recruitment of the individuals in organization will be more accurate and essential and this case can cause more organizational development and productivity.

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