

A Detailed Study to Examine Genetic and Environmental Influences on the Phenotype Relationship between Intelligence and Personality in Creative Achievements in Science

Seyedeh Faezeh Paranideh

Neyshabur Paramedical School, Neyshabur, Iran
e-mail: faezeparanideh@gmail.com

Abstract—Today, many studies have been presented in the field of intelligence and personality in creative progress in science which are based on genetic and environmental influences. The main purpose of this research is whether the relative influence of genetics and environment on the relationship between personality, intelligence and creative achievements is different in sciences. This research uses a questionnaire-based approach with intelligence scales with the help of the Wiener Matrizen test, personality traits based on BFI-44 and the creative development questionnaire of people. The sample size was 1350 people. At first, various tests have been presented for phenotypic analysis and the results of these analyzes indicated intelligence and personality traits are two important characteristics that significantly contribute to the creative achievements of science. Intelligence has been highly influential in science and its main factor is genetics and personality structure of people. Then a genetic modeling has been done, the results represented individual differences in the remaining traits to consider by additive genetic effects and non-shared environment. The results of two analyzes indicated a three-variable structure including intelligence and creative achievements in science. Likewise, genetics represented a significant rate in the creative field.

Keywords: *Genetic and Environmental Influences, Phenotype, Intelligence, Personality, Creative Achievements*

I. INTRODUCTION

One of the defining characteristics of human beings is creativity which is simply defined as the ability to present new and useful ideas [1]. With creativity, not only can create a better adaptation to the environment, but it can also adapt the environment. In this regard, humans have a natural capacity

for creative thinking, but it is clear that creative thinking is formed based on the knowledge and experiences gained by humans. In addition, creative achievements require maintaining, evaluating, developing and realizing ideas that are useful according to the conditions of a particular environment. Thus, obvious creativity is the product of a complex interplay between nature and nurture which something is true for virtually all human traits [2, 3]. It may seem that the relative importance of genetic and environmental influences is revealed at different stages of the creative process and the underlying factors. Nevertheless, this is a very important task to be undertaken if optimal ways to identify talents, foster creative thinking, and maximize creative output for the benefit of individuals and society are to be found.

Using the classical twin design as a common scientific approach to investigate the relative effects of genes and the environment on a human trait depends on comparing the phenotypic similarity of identical (monozygotic - MZ) and fraternal (dizygotic - DZ) twin pairs. Of course, there is an assumption that environmental influences are similar for all twin pairs [4]. Calculating the difference between the within-pair correlation for MZ twin pairs that share all genes and DZ twin pairs that share on average half of their segregating genes provides an estimate of the contribution of additive genetic differences (A) in phenotypic diversity. Furthermore, shared environmental effects (C) are involved if the DZ correlation is greater than half of the MZ correlation. Dominant genetic effects (D) are indicated if the DZ correlation is less than half the MZ correlation. However, there is insufficient information in the classical twin design to isolate the simultaneous effect