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The contribution of genetic and environment factors in shaping behaviors

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Introduction

The difference in behavior of two individuals can be attributed to various factors, in spite of the fact that they have similar physical traits and testing environments. The modern day scientists accredit both, the genetic factors and the environmental impact over the behavior, mostly channelizing their research on the mutual interaction among these factors (Breed & Sanchez, 2010). It has already been testified that genes cast their effect over the morphology and physical traits of an individual (Bazzet, 2008). Further, they create a base framework inside which the environmental factors affect the behavior of an individual.

The environmental factors can also influence the morphological and physical attributes orientation; in thereby causing an individual's behavior getting shaped from internally absorbed environmental aspects. The genetic factors create the pre built adaptive platform for learning, memorizing, and using cognitive skills (Bouchard & Gue, 2003). The above mentioned behavioral impacts are some of the most extraordinary mechanisms that enable individuals to obtain and accumulate necessary information, from and about their surrounding environment and ultimately get deployed in shaping their behavior. In this article, we will see through various researches conducted in the field of behavioral genetics studies, aimed at analyzing the impact of genetic and environmental factors in shaping the corresponding behavioral differences among individuals(Breed & Sanchez, 2010).

Thus the prime objective of this study is to enlist and elaborate various methods used (in the field of behavioral genetics) for obviating the relative contribution of genetic and environmental factors in shaping the behavior of individuals. We will summarize the basic research methodology used by the organized researches in this field and seek to elicit over their worthiness and precision in developing the objective results of the targeted work. A reference base of 8 organized researches in this field will be deployed in the article to attain this motif.

Methods used in behavioral genetics for impact of environmental and genetic factors

There have been different ways utilized by the researchers to study the impact of genetic and environment factors over influencing the human behavior (Bouchard & Gue, 2003). The most common object of these studies involves examining the effect of genotype (an individual's DNA complement) and environmental, over a range of phenotypic (externally acquired traits other than genetic adaptations) attributes like those of anxiety, poignancy, anti-socialism and sexual inclinations (Hernandez & Blazer, 2006). The below mentioned details encompass the main of these methods:

Genetic Epidemiology: This method breaks the variations among the members of a specific focus group on the basis of their causal factors, viz. environmental factors and genetic factors. Then further sub classification comes in terms of changes in behavior acquired as a family and those attained as individuals. Further the use of quantitative genetics helps in elucidating the exact impact of each of the factor for shaping the behavior of individuals observed and tested in the studies.

Quantitative Genetics: The most prominent method in field of behavioral genetics which involves observational study, comprising of assessing and simultaneously comparing the relatives, like twins, siblings, adopted child etc. The method aims at using quantitative methods to evaluate the extent to which a factor (environmental or genetic) influences the changes in individual behaviors from the rest of the assessed people.

Molecular genetics: The second germane method used in behavioral genetics, which tries to differ among the genetic factors (typically different genes) which cause difference in behavioral traits (Riley, 2003).

Animal based studies: These studies involve selective mating experimentation conducted over animals and ease off the relative traits and behavioral difference analytic studies.

Research application of behavioral genetics research methods

Heritability studies: The heritability refers to the segment of phenotypic variations in behavior that are hereditarily acquired over a specific population of individuals. Hence linking the root cause to genetic factors. The prime reason of geneticists studying behavioral changes due to genetic effects is that the chromosome theory for inherited characteristics and core principles of molecular biology, both focus on testing and evaluating the genetic hypothesis (Bouchard & Gue, 2003).

This is quite lacking on front of environmental factors analysis behind their contribution to behavioral differences, as no such precise research method exists for them.

Family behavior studies: The most affable platform to study genetic impacts

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lies in family based studies, as most of the environmental factors get constant for family members like twins and siblings (Lenroot & Geidd, 2008). Further, it is relatively easier to evaluate genetic influence by comparing with lineage history and earlier incidences of significant behavioral differences (in case of assessing multi-gene traits)

However, on account of close interconnection between similarity in genetic and environmental traits for the members of a family, there exists an ambiguity regarding precise causal from these two traits. Hence a precise method is required for family members, to demarcate the impact caused due to genotype and environmental factors.

Twins behavior studies: Genetic epidemiology comes into picture for analyzing the behavioral differences between identical and fraternal twins. As the main difference in the genetic structure of twins comes only in number of DNA they share, better evidences are available in case of identical twins to evaluate the contribution of genotypes towards traits (Lenroot & Geidd, 2008). The most advantageous aspect of executing such researches lies in the fact that the genetic and environmental factors influence can be easily differentiated in case of identical twins.

An upper hand in conducting the twin studies for analyzing behavioral differences comes over family studies as different members of the family vary in terms of their age, changing the tenure of the affecting factor, while twins have no such constraints (Rhee & Wieldman, 2002).

Linkage analysis: Molecular genetics concepts are utilized in analyzing the transmission of specific genes locations across generations (referred as Gene markers) , with respect to the stable genes found in members. Hence, this

method uses the commonly persisting chromosomal signatures in family members, to ensure a link among them. The above analysis works easily for the Mendelian traits and for analyzing the complex traits, quantitative non parametric methods are used.

Genetic mutation and DNA sequencing: Using exact gene locations and linkage in case of interlinked individuals, the process of analyzing genetic mutation is carried out. This process not only results in explaining specific trait development and changes, but also leads to the scope of manipulating the gene structures and inducing behavioral changes in individuals. The culmination of this research methodology results to a highly complex process known as Genetic positional cloning, capable of creating planned behavioral changes and trait development in individuals.

Conclusion

The most indistinguishable line of interface between the genetic and environmental factors, influencing the traits and behavioral changes in individuals, should be kept aloof from those of physiological traits and changes, as most of the individuals inherit them from their parents (White, 2014). Each study conducted so far for analyzing the cause-effect relationship with those of behavioral changes and specific traits, links to either genetic or environmental factors. After all, each trait has a genetically linked component to it and each behavioral change, acquired over the time, can be aligned to an environmental factor (White, 2014). .

A specific trait, evident in a specific population may be a result of genotypic influence, whereas same trait might be present in individuals of a different

population and may be a consequence of environmental factors (Hernandez & Blazer, 2006). Hence, we cannot standardize the results to all other instance of human behavioral change, if an influencing factor is found to be ratified in case of a specific pool of individuals.

So, although major work is already done in field of developing research methods for understanding the impact of genetic and environmental factors, in influencing the behavioral changes, it still remains dubious to have an exact correlation of them with extremely complex human behaviors.

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