

Importance of Behavioral Genetics on Psychological Development of the Person

Bhavyaja.C

Behavioral Genetics, Sujatha Degree College

Abstract-The study of behavioral genetics holds great promise for revealing the genetic and environmental factors that impact both typical and abnormal behaviour. The ideas and techniques that have been used to identifying the constituent parts of complex human characteristics serve as the foundation for behavioral-genetic procedures. To analyze the genetic component of these complex features, new tools are now accessible. We can start investigating how certain genes interact with environmental variables in development as they are discovered. Important factors to take into account include how we interpret these results, how we pose fresh questions, how we celebrate the information, and how we make use of or abuse this knowledge. These problems are prevalent in all human research fields, but they are particularly evident in human behavioral genetics. In this paper, we review the results of studies and theories, explore their implications for our knowledge of adult personality development, and highlight outstanding issues that require more investigation.

INTRODUCTION

As believed by various scientists, the genotype of the person influences almost all the traits of a person. But the point of interest or question is that ‘Are the genes, only the triggering factor for the expression of various traits or are there any other factors which work in conjugation with genes and influence its action. The answer to this question can be explained by ‘the Behavioral genetic studies’, which aims at understanding the genetic and environmental influences on behavior.

In this paper, the topic of interest picked to consider is the ‘the importance of behavioral genetics on psychological development of a person’. This paper provides you a ‘bird’s eye point of view’ of the effect of genotype on personality and how the environment shows its effect on the expression of a particular gene. ‘From the moment of conception it grows.’ whole, having within itself possibilities of developing into a

dynamic, active, walking, talking, thinking, feeling human being, provided that the environment furnishes the raw materials and the appropriate conditions of stimulation.”(1). This perspective clearly suggests that the environment triggers or suppresses the action of genes under certain circumstances.

Genes Vs Environment:

It is a well-established fact that the genes are the basis for the expression of any trait in living organisms. Talking more concisely, the development of psychological personality in human beings, there are various debates so far regarding the extent of impact or the contribution of genes and the environment. Though the impact of genes is likely on the person, it is often shaded and/or masked by various environmental factors that they are surrounded with.

According to the "first law" of genetics, "Each human conduct feature is heritable." Researchers in psychology, sociology, political science, economics and industry have proven that all conduct studied by their disciplines is inherited by the validity of this first law and by using statistical methods. —In addition, they say in several instances that unique genes have been found that play a part. (2). This is interpreted as the source for the development of personality of the person coming from genes- the genetic factors. Further, the quality of the scientific methodology used to justify these arguments will decide the various genetic conduct as a science.

It is also interesting to know that as per Kandler et al., (2017), Genetic Variations are no longer contentious, as they are reflecting the differences in all individual characteristics such as personality traits, which accounts to above 40% to 50% of diversity is due to genetic sources (3). The various tests of personality traits provide sufficient data to prove the heritability estimates stand way higher. The combined observations of multiple family genetics and

molecular genetics studies reveal minor effects of genes that communicate with each other in a complicated way and with the numerous environmental factors leading to its contribution to the genetic basis of the personality traits. An important point here to be noted is that the genetic variations caused by the individual interactions led to the creation of individual traits within the environmental opportunities.

As cited above, there are various scientific evidence which strongly supports the influence of environmental variables on the development of psychological personality. Data from adoption research suggests that the shared environment affects the cognitive ability of children at an early point of life, but this effect eventually deteriorates as hereditary factors grow in their developmental impact. This indicates that upbringing and other family influences like financial status, educational background, etc. have an effect on the success of younger children in IQ assessment but are shortlisted. Biology, i.e., genetic factors are crucial to human variation in the cognitive skills in adulthood rather than nurturing them (4). However, a word of caution is justified. The findings involve children residing in the usual anticipated spectrum. the exploitation or neglect of children has very genuine harmful long-term effects.

The Various Psychological Theories explaining the personality of the person

About what personality means, psychologists disagree with one another. The word "personality," which most people think refers to as a theatrical mask used by Roman players in Greek tragedies, was first used in Latin. The masks (personas) used by these historical Roman actors were used to create a character or fake look (5). Naturally, this superficial description of personality is inadequate. The word "personality," as used by psychologists, refers to more than just the roles that people perform.

There isn't a specific definition of personality that all personality theorists agree on, though. Since they disagreed on the essence of mankind and each viewed personality from a different perspective, they really developed original and important theories.

All theories are a mirror of the individual backgrounds, early life experiences, philosophies of life, interpersonal interactions, and distinct

worldviews of their writers. Because each observer's frame of reference affects how they interpret data, there may be a wide range of ideas (5). Divergent theories can still be helpful, though. A theory's utility is determined by its capacity to produce research and to describe research data as well as other observations, not by its applicability to common sense or by its conformity with other theories.

Viewpoints in Personality Theories

Psychologist's attempts explaining how people's ideas, feelings, motivations, and behaviors function. There are 5 kinds of perspectives

Psychodynamic theories

Since Freud, psychodynamic and then more broadly psychoanalytic methods have emphasised the significance of early events and parental interactions as forces influencing personality development (5). This viewpoint holds that the unconscious mind and motivations are far more potent than conscious awareness. As a primary method of treatment for mental disease and neurosis, psychoanalysis typically employed dream interpretation to elucidate the unconscious ideas, feelings, and impulses. Following Freud, these thinkers shifted their focus from the significance of sexuality to social and cultural causes.

Humanistic-Existential Theories

The main tenet of the humanistic approach—currently referred to as "positive psychology"—is that individuals seek for purpose, development, wellbeing, happiness, and psychological health. Happiness and good emotional states promote prosocial conduct and psychological well-being (5). Studying these adaptively beneficial features of human behaviour offers just as much insights into human nature as understanding the problematic ones. Existential theorists believe that in addition to our desire for meaning, we are also motivated by unpleasant events that can lead to psychological development. These experiences include failing, facing mortality, losing a loved one, and experiencing anxiety.

Dispositional Theories

Dispositional theorists contend that the distinctive and enduring propensities to act in certain ways make up the core of our personality. The term "trait" refers to these particular tendencies, including such

extraversion or anxiousness (5). The discipline has come to the consensus that there are 5 main characteristic dimensions in individual personality. Certain actions are made more probable in some persons by traits.

Theories of biological evolution

Individual variations in fundamental genetic, epigenetic, and neurological systems have an impact on behaviour, thoughts, feelings, and personality. Some persons have distinctive characteristics, attitudes, and modes of thought because of variations in their chromosomes and central nervous systems (neurochemistry and brain structures). Human intellect, conduct, and personality have been influenced by processes of evolution (natural and sexual selection) over millions of years since they are founded on developed brain systems. Environment, body, and brain interact and develop together, and this viewpoint stresses that what we experience psychologically is more important than everything else, therefore, Nature (biological) and nurture interact to shape what we think, feel, and do (5).

Theories of learning-(social) cognition

Focus solely on conduct, not hypothetical situations, if you want to comprehend behaviour and internal, imperceptible states including emotions, motivations, urges, and ideas.

All actions are taught by association and/or their results (whether it is reinforced or punished). To mold desired behaviours, we must first comprehend and then create the circumstances that lead to those specific actions (5).

Sexual psychology and personality

Eysenck was the first to seriously examine the connections between sexuality and personality (1976). We may try to frame our knowledge of the connections between sexual psychology and personality as a result of sexual selection by following the advice provided from an evolutionary perspective (6). According to the parental investment theory (Trivers, 1972), human females would invest more resources in raising their children, whereas males will prioritize mating.

Genes and Well Being

Happiness is no exception to the rule that genetic variables tend to play a significant effect in the

majority of human characteristics (7). Heritability estimates generally vary from 0.30 to 0.50 (8,9,10,11,12,13). Various conceptualizations of wellbeing. A meta-analysis of 13 research from seven distinct nations with more than 30,000 twins found a weighted average heritability of 0.40 for happiness (14). Further supporting the theory that there is no set heredity for wellbeing, this meta-analysis discovered significant variation in heritability estimates among studies, above and above that predicted by random fluctuations. Instead, the proportion of variation explained by hereditary variables differs among cultures, age groups, and the specific wellbeing phenomena addressed. The average heritability for wellbeing was 0.36 according to a separate meta-analysis by Bartels⁶, which used somewhat separate inclusion criteria, samples, and analytical methodology (15).

There is evidence of both genetic impacts that are particular to the various components (16,17) as well as genetic factors that are common to the many wellbeing components, such as subjective happiness, life satisfaction, SWB, and PWB. The genetic impacts on social support (18) and, in reverse, depression (19) and internalising disorders (20,21,22), are partially connected to the genetic influences on wellbeing. Longitudinal studies have furthermore demonstrated that genetic variables are largely responsible for the stability in wellbeing, with heritability for the stable variation, or dispositional wellbeing, predicted in the range of 70–90% (23,24). In contrast, the primary cause of variance in wellbeing is environmental factors (24,25).

Despite abundant evidence of significant genetic implications on welfare generally, results on life satisfaction are inconsistent, with heritability estimations varying from zero to 0.59 (12,22,25,26,27,28). The meta-analysis by Bartels (15) particularly looked at the heritability of life satisfaction and found that it had an average heritability of 0.32. Thus, compared to other aspects of wellbeing, life satisfaction seems to be considerably more impacted by environmental circumstances. Furthermore, although rates of life satisfaction often only minimally change with age, genetic and environmental influences may also moderate with age. Given that life satisfaction is an assessment of one's life so far, older age presumably entails more life experiences, challenges, and victories than younger

age, indicating greater environmental than genetic influences.

Environmental Factors

Societal influences on personality

When an individual has group experiences and contacts with others, his or her personality is influenced by others in a give-and-take relationship that may be positive or negative depending on the associations in which he or she maintains. Every person has a unique position and status in a society.

Towards instance, younger people in our culture are expected to show respect for seniors. Numerous additional social elements, such as the environment, social interactions with others, family, and media, shape people's personalities on a daily basis. It's possible to state that anything that comes into touch with a person's social life has an impact on their personality and determines whether they have a good or poor personality.

Culture's Influences on Personality

An individual's personality is influenced by both material and non-material culture. People who are immersed in their culture either deliberately or unintentionally embrace the qualities and behave appropriately. An individual's personality and actions are determined by the culture of the society in which they live, and they are expected to behave accordingly. When someone conforms to all of the social standards of a society, a good personality is formed, but when someone doesn't, an abnormal or bad personality is formed. Thus, a person adjusts to and develops their personality in the society in which they seek happiness.

Geographical Setting

Additionally, a person's physical surroundings affect their personality. Land, rivers, hills, mountains, forests, plains, and other environmental aspects can influence a person's personality and whether it is strong or weak, good or negative. A person's physical environment, to which they belong, determines all of their thoughts, feelings, opinions, attitudes, routines, and behaviour as well as their physical makeup. As an illustration, rural and urban populations differ in terms of body type, physique, colour, and health. These individuals grow into a range of personalities as a result of their varied environments. Contrary to rural

residents who lack these amenities, city dwellers have facilities and sophisticated lifestyles that help sensitive bodies and minds grow.

Situational Factors of Personality

A person's personality development is also entirely influenced by situational conditions. Situational personality traits change in response to social circumstances. Every individual encounter a variety of circumstances during their lives that provide them the opportunity to alter their behaviour. For instance, a teacher could be harsh and strict with pupils but not with his or her own family. An officer could act differently among subordinates than they would with friends. Personality isn't the outcome of just one thing; each component contributes equally to its creation. When a person interacts with their surroundings, culture, society, parents, friends, and random strangers, their behaviour and personality come into being.

According to behavioural genetics research, environment influences personality, yet siblings are not identical. This has been taken as a challenge to the notion that raising children and family gatherings are significant. Reviewing behavioural genetics and developmental psychology research, the following conclusions are drawn: Due to methodological, measurement, and outcome variable limitations, sibling dissimilarity may be overestimated; however, developmental psychology conceptualises the family as involving interactions between the person and their environment, and personality as being multidetermined, so sibling dissimilarity is not surprising; additionally, objective and subjective family experiences differ for siblings due to age differences, birth order, genetics, gender and idiosyncrasies; and finally, sibling dissimilarity is not surprising.

Introduction and Definition of the Multidimensional Personality Questionnaire

The Multidimensional Personality Questionnaire (MPQ) is a self-report questionnaire used to measure personality using 11 lower-order ("main") trait scales that load onto three higher-order variables that represent temperamental characteristics. The entire edition of the inventory has 276 items; there are also shorter versions with standard and simplified wordings (155 and 157, respectively). The MPQ only

accepts "true" or "false" responses for each question. Along with this, the inventory includes validity scores that evaluate social desirability, acquiescence vs "nay-saying," and random response. The MPQ has been especially helpful in elucidating the connections between psychological dispositions related to temperament and both normal and unhelpful conduct (29).

The Multidimensional Personality Questionnaire is a normal-range personality test that evaluates a variety of fundamental characteristics like emotional sensitivity and motivation, interpersonal style, and more. To estimate higher-order broad dimensions like Positive Emotionality (PEM), Negative Emotionality (NEM), and Constraint (CON), these trait scores can be differently weighted. Broad trait scores, on the other hand, must be almost entirely administered since they must be calculated using proprietary regression algorithms (30). Through the development of condensed item-based estimates of these weighted scores, we intended to improve measurement effectiveness. Classical test theory and item response theory methodologies were utilized to choose five items from each primary trait scale that approximated the weighted estimates while still retaining the breadth of MPQ content coverage in order to parsimoniously define and separate the broad qualities. (30)

CONCLUSION

Every person's behavioural and psychological traits—including intelligence, personality, and susceptibility to mental illness—are influenced by genes. These traits can have an impact on both parents and children within a family.

There are three major findings. First, throughout the adult life span, there is a strong and largely stable genetic basis for individual differences in personality; second, environmental influences become more significant and contribute to an increasing rank-order stability of personality traits; and third, both genetic and nonshared environmental influences influence both the stability and change of personality traits. For the future research, (i) Identification of quantifiable environmental elements and (ii) to depict the interaction of hereditary and environmental factors on personality stability and variation throughout adulthood will supposedly be critical subjects.

Patient informed consent: There is no need for patient informed consent

Ethics committee approval: There is no need for ethics committee approval.

Conflict of interest: There is no conflict of interest to declare.

Financial support and sponsorship: No funding was received.

Authors ORCID numbers: 0009-0007-0767-7574

Author contribution subject and rate:

Author name abbreviation initial-last letter (50%): Design the research, data collection and analyses and wrote the whole manuscript. – Bhavyaja. (2023)

Author name abbreviation initial-last letter (20%): Organized the research and supervised the article write-up.- Bhavyaja. (2023)

Author name abbreviation initial-last letter (15%): Contributed with comments on research design and slides interpretation.- Bhavyaja. (2023)

Author name abbreviation initial-last letter (15%): Contributed with comments on manuscript organization and write-up. Bhavyaja. (2023)

The entire article is written by a single author with ORCID number: 0009-0007-0767-7574

REFERENCE

1. <https://egyankosh.ac.in/bitstream/123456789/46890/1/Unit-4.pdf>
2. Charney, Evan. (2016). Genes, behaviour, and behaviour genetics. Wiley Interdisciplinary Reviews: Cognitive Science. 8. 10.1002/wcs.1405.
3. Kandler, Christian & Papendick, Michael. (2017). Behaviour genetics and personality development: A methodological and meta-analytic review. 10.1016/B978-0-12-804674-6.00029-6.
4. <http://journals.sagepub.com/doi/abs/10.1111/j.1467-9280.1997.tb00458.x>
5. Theory of Personality – Tenth Edition by Gregory J. Feist, Ph.D., San Jose State University, Tomi-Ann Roberts, Ph.D., Colorado College, Jess Feist, McNeese State University. <https://pdfuni.com/sample/PoliticsSociology/PS1401-1500/PS1480/sample-Theories%20Of%20Personality%2010th%2010E%20Gregory%20Feist%20Jess%20Feist.pdf>
6. <https://www.sciencedirect.com/science/article/abs/pii/S0191886909004383>

7. Polderman, T. J. C. *et al.* Meta-analysis of the heritability of human traits based on fifty years of twin studies. *Nature Genet.* **47**, 702–709 (2015).
8. Nes, R. B. Happiness in behaviour genetics: Findings and implications. *J Happiness Stud* **11**, 369–381 (2010). Return to ref 20 in article
9. Røysamb, E., Tambs, K., Reichborn-Kjennerud, T., Neale, M. C. & Harris, J. R. Happiness and health: Environmental and genetic contributions to the relationship between subjective well-being, perceived health, and somatic illness. *Journal of Personality and Social Psychology* **85**, 1136–1146 (2003).
10. Nes, R. B. & Røysamb, E. Happiness in behaviour genetics: An update on heritability and changeability. *J Happiness Stud* **18**, 1533–1552 (2016).
11. Røysamb, E. & Nes, R. B. In *Handbook of well-being* (eds Diener, E., Oishi, S. & Tay, L.) Ch. The genetics of well-being (DEF Publishers, 2018).
12. Bartels, M. & Boomsma, D. I. Born to be happy? The etiology of subjective well-being. *Behavior Genetics* **39**, 605–615 (2009).
13. Archontaki, D., Lewis, G. J. & Bates, T. C. Genetic influences on psychological well-being: a nationally representative twin study. *Journal of Personality* **81**, 221–230 (2013).
14. Nes, R. B. & Røysamb, E. In *Genetics of Psychological Well-Being* (ed. Pluess, M.) 75–96 (Oxford University Press, 2015).
15. Bartels, M. Genetics of wellbeing and its components satisfaction with life, happiness, and quality of life: A review and meta-analysis of heritability studies. *Behavior Genetics* **45**, 137–156 (2015).
16. Franz, C. E. *et al.* Genetic and environmental multidimensionality of well- and ill-being in middle aged twin men. *Behavior Genetics.* **42**, pp (2012).
17. Archontaki, D., Lewis, G. J. & Bates, T. C. Genetic influences on psychological well-being: A nationally representative twin study. *Journal of Personalit y.* **81**, pp (2013).
18. Wang, R. A. H., Davis, O. S. P., Wootton, R. E., Mottershaw, A. & Haworth, C. M. A. Social support and mental health in late adolescence are correlated for genetic, as well as environmental, reasons. *Sci Rep-Uk* **7** (2017).
19. Nes, R. B. *et al.* Major depression and life satisfaction: A population-based twin study. *J Affect Disorders* **144**, 51–58 (2013).
20. Kendler, K. S., Myers, J. M., Maes, H. H. & Keyes, C. L. M. The relationship between the genetic and environmental influences on common internalizing psychiatric disorders and mental well-being. *Behavior Genetic s.* **41**, pp (2011).
21. Bartels, M., Cacioppo, J. T., van Beijsterveldt, T. C. E. M. & Boomsma, D. I. Exploring the association between well-being and psychopathology in adolescents. *Behavior Genetic s.* **43**, pp (2013).
22. Nes, R. B., Czajkowski, N., Røysamb, E., Reichborn-Kjennerud, T. & Tambs, K. Well-being and ill-being: Shared environments, shared genes? *The Journal of Positive Psychology* **3**, 253–265 (2008).
23. Nes, R. B. & Røysamb, E. Happiness in Behaviour Genetics: An Update on Heritability and Changeability. *J Happiness Stud* **18**, 1533–1552 (2017).
24. Nes, R. B., Røysamb, E., Tambs, K., Harris, J. R. & Reichborn-Kjennerud, T. Subjective well-being: genetic and environmental contributions to stability and change. *Psychological Medicine* **36**, 1033–1042 (2006).
25. Røysamb, E., Nes, R. B. & Vitterso, J. In *Stability of Happiness* (eds Sheldon, K. & Lucas, R. E.) (Elsevier, 2014).
26. Caprara, G. V. *et al.* Human Optimal Functioning: The Genetics of Positive Orientation Towards Self, Life, and the Future. *Behavior Genetics* **39**, 277–284 (2009).
27. Harris, J. R., Pedersen, N. L., Stacey, C., McClearn, G. & Nesselroade, J. R. Age differences in the etiology of the relationship between life satisfaction and self-rated health. *Journal of Aging and Health* **4**, 349–368 (1992).
28. Hahn, E., Johnson, W. & Spinath, F. M. Beyond the heritability of life satisfaction-The roles of personality and twin-specific influences. *J Res Pers* **47**, 757–767 (2013).
29. Tellegen, A., Ben-Porath, Y. S., McNulty, J. L., Arbisi, P. A., Graham, J. R., & Kaemmer, B. (2003). *MMPI-2 Restructured Clinical (RC) Scales: Development, validation, and interpretation.* Minneapolis: University of Minnesota Press.
30. <http://pubmed.ncbi.nlm.nih.gov/34292000/>