

## **Nature and nurture interaction; The basis of who we are and how we behave.**

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**ABSTRACT:** There has been a vigorous debate in recent time, about heredity versus environment and how they coalesce to create personalities, behaviors, and psychopathology that appeared unique to each person and influenced their developmental process. This paper explores and used different methodological approach to lifespan development to underline how the interaction between heritable and ecological factors contributes to behavioral changes and continuity. The study planned to increase our knowledge and understanding of the behavioral growth and patently recognize etiological mechanism that support the assumption that a particular hereditary or environmental condition ultimately lead to behavioral feature and changes during development. The study used the accessible materials on lifespan development to analyse the continuous source of person uniqueness in personality development. Finally, citing evidence from various multidisciplinary studies, the article concluded that shared environment significantly influenced human behavior but decline with age and that the strong interaction between the two factors formed the basis of who we are and how we behave.

[Olusegun Emmanuel Afolabi. **Nature and nurture interaction; The basis of who we are and how we behave.** *Academ Arena* 2013;5(12):1-11] (ISSN 1553-992X). <http://www.sciencepub.net/academia>. 1

**Keywords:** Twins, shared environments, nature, nurture, personality, genetic, ecological, continuity, interaction, attitude, human development, lifespan,

### **Introduction**

There has been a vigorous debate in recent time, about heredity versus environment and how they coalesce to create personalities, behaviors, and psychopathology that appeared unique to each person and influenced their developmental process. Studies on human development shed more light on the significant effects and associations between nurture, nature and human behavior. However, this assumption support the general views that human development cannot complete without proper knowledge and understanding of the interaction between internal and external variables on personality. Human behavior is an experience of a life span, therefore, our orientation about life and the way we react to the situation around us is as results of interaction between different psychosocial factors such as genetics, social norms, core faith, and attitude.

Besides, numbers of prominent scholars 'have come out with evidence that support the assertions that our social world, in which we live include our family origin, school, vocation life, or even an entire community, all offer developmental options and common limitation that affect our behavior. Conversely, Bronfenbrenner, (1979) and Lerner, (2002) expressed a similar position that human behavior cannot be fully understood without mentioning the changing relationship between human and the contextual environment. This was supported by Bronfenbrenner's bioecological theory (Bronfenbrenner & Ceci, 1994) where they reported the interactions between people, families, peers, school, and society characteristics as a predictor of

personality differences in development. The milieu according to reviewed studies is the inner biological levels while outer are the social and environmental levels.

Also, the recent improvements and progress reported in the study of human molecular genetics has highlighted the need for further studies on how to integrate environmental measures into genomic studies, if we are to have a better understanding of the various mechanisms that support changes in human development. Besides, studies on the charting of the human genome and the equivalent accessibility of genome-wide association analysis (GWAS) techniques has increased research activities on how to decide "genes for" particular disorders and traits. Most review of literature on life span development highlights and improved our basic understanding of the mechanism involved in normal and abnormal behavior and highlights the significant importance of social and contextual environment on specific genetic variants in human behavior and traits.

### **Purpose of Research Paper**

This paper will explore various ways that describe the interaction between heritable and ecological factors in the path of behavioral growth and patently recognize etiological mechanism that support the assumption that a particular hereditary or environmental condition ultimately lead to behavioral feature and changes during development. The paper begins with brief overviews of the main tenets of lifespan development and highlight findings from different methodological approaches that explored the

significant influence of environmental and genetic competence on behavior across the life cycle. The paper will use some of the most interesting research literature and methodological approaches in life span development to illustrate the interplay of genes and environments on human behavior and underline how the interaction contributes to behavioral changes and continuity. Lastly, the paper will focus on how the existing interaction signifies continuous source of person uniqueness in personality development.

### **Methodology**

This paper employs and reviews the empirical literatures that analyzes, assessed and support the associations between environment and genetic factors and how the interaction lead to personal differences and changes across the life span. The literature review process is carried out by using online data base i.e. ERIC, PsychInfo, EBSCO host to search for the following key words either separately or in combination: nature, nurture, behaviour, heredity, genetic, personality. This process reported about 1400 articles, journals, technical reports and paper presentation and book chapters covering more than 25years period. Based on abstracts from the 1400 search reports articles cum journals, the search was lessened to quite a few studies that are relevant to the research topic. Therefore to achieve the aims of this paper, the content of the remaining several hundred journals or articles were scrutinised and only those that reported empirical findings were used in this study. Furthermore, the references are confirmed and verify using manual searches of relevant journals and articles related to the topic.

### **Literature Review**

#### **Historical Perspectives**

The introduction of heredity and environment to human development has received mixed reactions since its commencement in 1865. Evidence documented that research on nature and nurture on behaviour developed slowly. According to Galton, (1865) the first research work on heredity and environment was issued earlier before Mendel's paper. This was developed increasingly till 1924, when the primary work on adoption and twin research on human development was reported (Merriman 1924; Theis 1924). However, the situation of things ten years later significantly affected the recorded progress made in the study. The start of the Second World War and the war crime committed by the Nazi regime stop the growth and development recorded in genetic science. Evidence documented high rate of abuse on genetics committed by the Nazi regime and this significantly threatened the world peace and human development.

The rise of behaviorism during this period (Watson 1930) showed the barrier faced in the advancement of hereditary science, and have a massive bearing on the behavioral sciences despite its supposedly reassuring concept of ecological model grounded on a statement that we are who we are because of our inherited gene. Nevertheless, the work of genetic research on human behavior continue to push for the recognition of the significance of heredities and milieu on behaviour. The review of literature on the concept reported how psychology documented the influence of genetic and environment on twins and adoption studies (Plomin, DeFries, et al., 2001). Evidence showed that most studies on hereditary constantly reported genetic impact in numerous traditional parts of psychological studies like psychological disorder, behavior, intellectual infirmities and skills, and substance use and misuse. This statement lends credence to the significance of genetic factors and the situation in the aetiology of person uniqueness in behavior. Additionally, society also acknowledges the significant input of genetics, for instance, a latest survey reported that over 90 percent of caregivers and educators described heredities as the lowest contributor to mental disorder, behavior, learning disabilities and intellect compare to the environment (Walker and Plomin 2005). However, before the swing of style changes from genetic toward the environment, hereditary research offers the finest obtainable proof for the significance of the milieu and this accountable for the statemet that heredities and milieu each explain for nearly half of the human adjustment.

#### **Nature and Nurture**

The assumption that race and individuality are the outcome of heredity, to say the least a biophysical phenomena, and that their interpretation is based on the philosophy and process of biology has continued to gain ground and dominate debate among scholars in the fields of social sciences. However, a general assumption among scientist support the causal correlation between environment, individuality and race. Consequently, the explanation of this concepts, i.e. (environment and heredity) is based on their interpretation of the developing organism. Therefore, to accept and apply the definitions to human development, literatures are analyzed from the following perspectives: different evolutionary theory, contributions of modern experimental genetics, and the findings of the social sciences.

Studies confirmed that the debate about nature and nurture interaction dominated and influenced most research studies on human development, therefore, formed the basis for discussion among scholars alike. Despite the

significant influence it has on human development, many psychologists view the issue as inconsequential and uninteresting to study. Nonetheless, the review of literature established that genetic and environment factors notably influence development of human behavior. Besides, reports showed that human being is a creation of genetic and its past background, while present background offers the basis for a proper explanation of current behavior. So, the interaction between hereditary and environmental factors, formed a particular trait in a human being, hence any specific differences associated with this trait is linked to either nature and nurture influence. Most research work highlights and review diverse area under discussion to analyze human behavior and psychopathology. Besides, evidence showed that most assessments focused on the assumption that genetic and environmental interest in an additive way. This assertion buttressed the opinion of both geneticists and psychologists that human behavior is grounded in the interaction of heredity and ecological (Haldane, 1938, Bjorklund & Pellegrini, 2002, Loevinger, 1943, Schwesinger, 1933 & Woodworth, 1941, Chiappe & MacDonald, 2005), and the level of influence of each reason is based on role carried out by the other. This assumption is quietly understood because children who did not share the same genetic factors, but reared in a similar adoptive household hardly take after or shared the same characteristics after the teenage years.

### **Methodological Approaches**

The past decade has demonstrated a significant rise in studies that outline the link within a particular feature in the hereditary conditions of persons and their characteristics manners and features. This experience continues to show a major shift from expressive and correlation strategies of the past years to new purposeful challenges that validate illustrative hypotheses. Besides, categorizing differences in psychological traits have lent credence to the general beliefs about significant changes in a group features following situational adjustment.

Therefore, there is an urgent need to explore various ways that explain the interaction between heritable and ecological factors in the course of behavioral growth and at the same time, shows the etiological mechanism that supports the assumptions that any inherited or natural situation will eventually lead to a change in human trait. These assertions, though debatable, continue to dominate various research studies on human development particularly, the words, "how" of heredity and environment. Therefore, the following ideas and promising methodological approaches will answer the question "how" in this paper.

### **The Impact of Genetic factors in Continuity and Change in Life Span Development**

The use of genetically informative designs to analyze human behavior has demonstrated and unravels importance of, interindividual differences in trait scores that come as a result of inherited attributes (i.e., genetics) and environmental influences. Similarly, recent studies on genetically informative longitudinal designs has unravelled the genetic and environmental factors that measured occasions, these include the process that estimate and explain the intensity of the stability of each element (i.e., hereditary and environmental continuity). Besides, recent literature shows that despite the assumptions of genetic continuity, it is not ideal and faultless (i.e., reliability coefficients are constantly minus 1) from childhood to adolescence stage (De Fruyt et al., 2006; Gillespie, Evans, Wright, & Martin, 2004; Spengler, Gottschling, & Spinath, 2012). On the other hand, most reviewed studies emphasis that during childhood and adolescence periods, fresh hereditary factors appeared and add to interindividual variation and sequential changes that exist in behaviour. Also, past and recent evidences on genetic influence showed that, similar to rank-order stability, genetic stability is enhanced from teenage years to middle age (Hopwood et al., 2011; Viken, Rose, Kaprio, & Koskenvuo, 1994) pending middle and late adulthood when it becomes stabilized and perfect (W. Johnson, McGue, & Krueger, 2005; Pedersen, 1993; Read, Vogler, Pedersen, & Johansson, 2006).

### **DNA**

The most significant event in hereditary study was the invention of the organization of DNA. This discovery led to the appreciating of the major structure that constitute DNA, i.e. heredity and DNA codes for protein. The review of literature maintained that the future of the hereditary study of behavior is based on molecular heritable research of DNA that detect precise DNA variations accounted for the general effect of genetic factors in behavioral change. Most research evidence shows that detecting the DNA variations helped in solving problems or matters that continually generating debates i.e. nature- nurture interaction, evolving, and multivariate instruments, with higher accuracy and influence. Research established that molecular inheritance significantly influence behavioral research and that studies do not need exceptional illustrations like in empirical hereditary research of twins and adoptee.

Similarly, research established that DNA can be acquired without much difficulty (from cheek wipes rather than blood), and this experience is also applicable to genotype of a DNA sign, which is also seen as economically (around 10¢ per person).

Besides, research also recognized the importance of the technique called gene chips (microarrays) that can be used to determine the genotype gene for hundred of thousand people within a period of three days (Butcher et al. 2004). Thus, literature on genetic influence on behaviour maintaining that it is easier and cheaper to implore a recognized gene than looking for genes related with difficult personalities. This is because such practice brings an important heritable element to behavioral study (Plomin et al. 2003b).

Consequently, research indicated that gene is the most single recognized threat feature for usual late-onset Alzheimer (LOAD) and that apolipoprotein E (APOE), significantly engaged in transporting saturated fatty acid. Studies confirmed that allele 4 genes definitely upsurges the danger fivefold for LOAD and documentation of the relationship amongst APOE allele 4 and LOAD was detailed ten years ago (Corder et al. 1993). Thus, there is abundant study currently focusing on the dementia of genotypes members for APOE which determine if it has different implication for persons with or devoid of this inherited threat features (e.g., Laurin et al. 2004; Mukamal et al. 2003; Podewils et al. Besides, studies maintain that genotyping APOE will turn out to be monotonous in a health setting if heritable threat influence is recognized as a predictor of differential reaction to mediations or cures.

### **The Effect of Environmental Factors in Continuity and Change in Life Span Development**

The results from environment studies on behavior do without question, offers evidence to support the statement that the secured inherited gap that happened in a person's when he or she become 40yrs, is not related to the putrefaction of stability coefficients reported in older age. Though, whether this assumption is convincing enough or merely suggestive is debatable among researchers. Nevertheless, the review of literature showed that those nongenetic influences add to rank-order continuousness. In a similar findings from a broad range of genetically informative studies, Johnson, Vernon, and Feiler, (2008) concluded that the main nongenetic basis of a person's dissimilarity in neuroticism and extroversion is unambiguous (i.e., not distributed through relatives nurtured as one) and this according to their findings are referred to as *nonshared environmental effects*. However, from a behavioral genetics perception, "environmental" include physiologically and biochemically intervened consequences, such as situational or ecologically triggered epigenetic influences. This illustrates that shared environmental factors demonstrate the disparity in permanence (i.e., environmental continuity) in term of age analyzed. A similar study

conducted by Gillespie et al., (2004) reported that children who are twins and age between 12 yrs and 16 yrs, showed significant low coefficients in ecological continuity for extraversion (i.e. .17 and .18 was reported for males and females respectively) and neuroticism (.12 and .36 for male and females) respectively. Additionally, Hopwood et al, (2011) conducted a study on developmental changes commencing teenage years on the way to adulthood (i.e. 17- 24yrs) and reported natural-continuity constants of .36 for negative emotive (neuroticism), .37 in support of common positive expressivity, and .39 for inherited constructive emotive in behavior, while (the last two qualities represent parts of extraversion). Moreover, the study also investigates the continuity sequence within the ages of 24 - 29, and for this intermission, they reported larger ecological continuity, with constants varied between .56 -.60. Also, Johnson et.al, (2005) detailed 5-year ecological-stability constants over .70 for middle adulthood and other studies such as Pedersen and Reynolds, (1998) and Read et al., (2006) showed high decrease in environmental continuity in old age.

### **The Genetic - Environmental Interaction**

The evidence often cited in various research studies in support of genetics and environment interaction shows that there is a high correlation between life narratives, memories and experiences, and this may have cumulative effects across the life span. Accordingly, results confirmed that environment has significant consequences of interindividual disparities on neuroticism and extraversion and also enhance through age, hence, results to ecological variance (McCartney, Harris, & Bernieri, 1990). Nevertheless, research also established that an increase in interindividual difference as a result of the ecological effects that rise with age, will lead to decrease in gaps that come from genetic effects and that inherited assessed qualities decrease with age. Thus, most studies on genetics that have measured heritability assess for diverse age cluster (e.g., Loehlin & Martin, 2001) reported no considerable disparities between age groups.

On the contrary, findings from studies combining cross-sectional information (on diverse age cohorts) and longitudinal information continue to show how heritability estimation lessening by age (Kandler et al., 2010; Viken et al., 1994). Besides, recent evidence from review of literature confirmed that other researchers have derived various methods that ascribe various personality changes to ecological factors like personal necessities in social roles (e.g., worker, partner, caregiver) associated capitals (Roberts & Wood, 2006), normative life expectancy stages (e.g., moving from one's paternal home,

finishing education/ a trade, leaving job due to old age), personal life situation that influence action that changes ones life (e.g., accidents, having a child or, marriage). To sum it up, research maintained that personality growth and adjustment are significantly linked with age-graded social functions and correlated expertise (Roberts, Wood, & Caspi, 2008). Another genetically revealing meta-analytic review study of fifteen diverse age groups showed high correlation between the amount of irritability of neuroticism and extraversion and age studied. This heritability of extraversion has a propensity to increase in people in their early 40s, and later declines continue, while for neuroticism, research shows that heritability progressively decreases when people have reached adulthood. The model observed amid cognitive ability with age, shows differences in the genetic contributions to interindividual disparities in neuroticism and extraversion. On the other hand, studies on cognitive abilities continually show how genetics rise with age (W. Johnson, 2010) and this confirmed that genetic material and environmental effects differentially contribute to human behavior (i.e. Personality ) and the level of their competence (i.e. abilities or skills). Therefore, a boost in the degree of behavioral trait inherent may replicate high consequence of dynamic and complex inheritable factor- environment correlations. This assumption proofs that individuals actively manipulate and influence their surroundings (e.g., by change their acquaintances, abodes, or professions) or exhibit social responses that relates to their heritable susceptible qualities, and that environments and social reactions influences the individual's disposition. Nonetheless, understanding life expectancy as manageable and productive will definitely enhance that kind of person's strengths of extraversion (Kandler, Bleidorn, Riemann, Angleitner, & Spinath, 2012), and the inherited effects to a degree build the ecological effects accounting for the mounting genetics components.

### **Cultural Studies**

Another potential study about the environment and genetic influence on human development was sighted in the relative study of nurturing practices in diverse beliefs and cultures. One of the earlier researches on culture was reported in the study conducted by Whiting and Child (1953). The study make use of data on 75 local people from the Cross-Cultural Files of the Yale Institute of Human Relations, to check the amount of assumptions concerning associations on nurturing practices and behavioral growth. This investigation was trailed by field remarks in five cultures, the effects of which up till now are not documented (Whiting, et al, 1954).

However, evidence on similar studies conducted emphasized more on various psychological situations offered by diverse social classes (Davis, et al., 1946).

Nevertheless, one of the most interesting studies is the one conducted by Williams and Scott, (1953) which focused on the relationship concerning socioeconomic level, broad-mindedness, and motor - progression amongst Negro children, and the investigative study by Milner, (1951) on the connection involving the reading willingness in first-grade youngsters and methods of parent-child relations. Milner, in his findings reported disparity between the lower-class child and the middle-class child. Moreover, the study analyzed the disparity between the two classes of children as "a heartfelt progressive family situation or adult-engagement system which act or seen as a motivational requirement for adult-controlled learning." However, the findings indicated that children from the lower-class see adults as mostly hostile. Besides, the study reported a broad prospect to relate orally to adult members in a household as a motivating factor. i.e. (attitude demonstrated by parents on chatting during meal time) and that parents from lower background tend to suppress and dampen down such discussion, whereas, parents from well to do family background will encourage such engagement in their home.

### **Twin Studies**

It has been well established that the argument about nature and nurture influence on human behavior cannot complete without exploring research on twin studies. However, recent evidence shows that most well-liked research on twin studies focuses on evaluating the resemblance between MZ and DZ twins jointly raised in the same environment or on a variable of interest (Jang, 2005). Research shows that both Identical twins, and monozygotic twins, are siblings with shared genotypes. Besides, study of identical twins serves as the best indicator that measure the significant influence of biology on traits and psychopathology in human development. For example, for a twin to have a dark hair or brown eyes, then the other twin will share the same characteristic of dark hair or brown eyes as well; nevertheless, the concept of identical genes perfectly match the phenotypes that forms the orientation and character of identical twins (Plomin, DeFries, McClearn, & Rutter, 1997). Also, earlier studies of identical twins, or dizygotic twins, shows that they shared half of their genetic traits with one another. Moreover, despite sharing 50% genetic traits, they provide less interpretation like identical twins in interpreting the level of heritable effect, but, they act as a commendable point of reference meant for evaluating identical twins.

The study of fraternal twins shows the similarity that exists in first-degree family, except that they are not sharing the precise same age, like identical twins. Consequently, twin research typically depends on an illustration of monozygotic and dizygotic twins; however, in a situation where biological influence is much more than ecological influence, dizygotic twins would have or display psychopathology behavior similar to each other compare to monozygotic twins (Plomin et al., 1997). This assertion further highlights the significant influence of heritability coefficient in human behavior i.e. the estimate of how individual's particular trait compares to others with similar characteristic is related to genetic materials (Olson, Vernon, Harris, Aitken, & Jang, 2001). Hence, research shows that the coefficient is significantly higher in identical twins compare to fraternal twins. On the other hand, research confirmed that identical twins often show diverse phenotypes (outside manifestation of genes) for similar genotypes (inherited composition). Therefore, studies explained that these attributes if noticed, represent nonshared situations.

### **Attitudes**

In addition Olson et al., (2001) conducted a study that defines the inherited of mindset and the innate features, such as cognitive which influence feelings and behavior among pairs of twins. Their findings show that there is significant correlation between attitudes displayed by the participants and genetic factors. The results also identified that assertiveness linked to self-reported perceptions or actions are frequently connected. The study for instance, asked the participants to grade the characteristic of their friendliness, and the findings show that the trait was related to 5 out of 6 behavioral features the participants displayed toward friendliness. Also the reports confirmed high correlation between attitudes toward athleticism and self-reported athletic abilities. The research highlights that a contributory model was particularly sustained for the reason that the physical ability (the mediator), is related to approaches toward athleticism. However, despite the general assertion on this model, it was revealed that the model is not free of criticisms, for example, it is difficult to believe that X is the source for the occurrence of Y in all circumstances. However, the approach to governance seemed to be connected to soaring self-ratings of physical attraction, friendliness, and fierceness. Nevertheless, the implication of these factors on behavior, showed that it is not probable to correctly think of constant associations regarding inherited traits and approaches to life (Olson et al., 2001). Additionally, studies proofs that uninsured background experiences between duos of twins played

significant impacts in determining the level of attitude variances and this overriding heritable predisposition and collective environment involvements (Olson et al., 2001). Moreover the term nonshared setting refers to as the element within the environment that have direct influence on one of the twins while the other one remain constant (Van den Oord, Boomsma, & Verhulst, 2000). However, some of the nonshared environment experiences are highly related to feelings and self-assessment of physical features and cleverness (Olson et al.).

### **Theory of Mind**

A study shows that beliefs, intents, and desires are very paramount to the development of human mental state. This assertion is well mentioned in various studies on human development as a theory of mind and clearly explained falsely interpretation or representation of the object and situation of a child at the age of four. However, based on these findings, research continues to search for answer on what really accounts for the variation in children false-belief grasp between biology and environment? Though, numerous evidences proved that children from extended families developed fast attainment of assumption of mind, but hearing-impaired children born to families of hearing adult's shows slow accomplishment of theory of mind. Though, this situation is due to cultural influences that come because of environmental influences. Moreover research also reported that children with autism disorder also exhibit impaired theory of minds, these include girls diagnosed of chromosomal disorder Turner's syndrome. However the development is linked to heritable effects (Hughes et al., 2005).

Hughes et al., (2005) conducted a research on identical and fraternal twin to test the implication of genetic and environment of theory of mind. The study explores social status, spoken ability, and last but not the least, the assumption of mind of each subject. The survey questions contained information that tested the aptitudes of participant to tie a phony conviction around a character presented the stories given, while the second phase of the survey package contain questions that measured the participants' skills to assume and abilities to deduce an untrue conviction about behavior in a given story. However, their finding shows that the recorded variation that existed between the twin's theories of minds is due to uninsured environments and the proportional power in lessening direction were linked to common situations, vocal aptitudes, and heredity.

### **Adoption Studies**

Interestingly, research on adoption and how it influences human behavior and psychopathology is highly debated by researchers studying heredity and

environment. Numerous evidence shows that adoption studies are very vital to human development and contain factors that invariably responsible for the disparities in human behavior : biological caregivers and environmental caregivers. Similarly, evidence shows that the significant relationship that is associated biological ancestries and the adopted youngster is influenced or related to genetics. Likewise, research also revealed that any association or links involving the adoptive parents, and the adopted youngster is typically ascribed to the contextual setting (Plomin et al., 1997). Additionally, the review of literature consistently mentioned that the basis for research on adoption is to ascertain if the adopted offspring have the same characteristic like their blood relatives which is a sign of heredity effects, and their common environmental effects which signifies their connection with their adoptive families. Most of the work on adoption studies was carried out in Scandinavian countries, where the researchers are allowed to assess and use the national records to determine relatively vast and representative cohorts of adopted persons along with their adoptive and biological relatives. Similar to twin studies, most research work on adoption studies are exploring from empirical research, the majority of which supported the effectiveness of this method (Cadoret 1986, Plomin et al 1990b). However, an adoptive household represent those who are poor and the underprivileged people in the society, thus limited the significance of ecological effects in adoption research. Therefore, ecological implications is related to the few fortunate or generally established middle classes.

### **Intelligence**

Research has continued to associate individual uniqueness in intelligence as a noticeable feature of human psychology, and as a strong predictor of individual life outcome. The source of individual differences in IQ is mostly discussed, and this discussion continuously ponders on whether differences noted in IQ are related to heredities or the environment, usually denoted as the “nature vs nurture” discussion. Evidence long established that the origin and heritability of intelligence continue to divide scholars’ opinion particularly how differences in human intelligence is attributed to genetics and not environmental. Recent evidence shows that most of the argument is based on whether the elements of IQ instability alter with age or splitting ecological effects into common and uncommon elements. Thus absence of empirical foundation that supports both the natural and the ecological theories is confirmed by a huge chain of data collated in the past years. In fact, reports showed that inconsistency in reasoning skills and behavior in person is due to the interaction of

inherited and ecological factors. Therefore common environment is seen as all ecological factors that make people who grew up or reared in the same household to behave in the same way. This situation includes family features such as socioeconomic status, parenting practices, ethnic factors (Jensen, 1997).

The reviewed literature established that most of the research work that reported low significant effect of a common environment on adult intelligence originated from adoption studies. In fact, most of the reviewed literature established nine studies on the topic. However, evidence shows that seven of such studies, Petrill et al. (2004) — mostly contain IQ scores of children and adolescence, age between 0-16 years who participated in the studies. Moreover, one of the nine research work engaged young people between the age of 16 - 22 years, and the average age of 18 years. (Scarr & Weinberg, 1978). Also, Teasdale and Owen, (1984) in their study engaged mostly 18yrs older people; and last but the least Loehlin et al., (1997) used a longitudinal research and administered IQ tests on participated member one time at a median age of 8 and 10 years respectively. Research documented high rise in the transmission of IQ through age by reported about 30% in infancy to 80% in adulthood (Spinath et al, 2006; Johnson et al, 2007; Jacobs et al, 2007; Edmonds et al, 2008; Deary et al, 2009). However, existing models of genetics-environment associations of human intellect assume that every age indicates particular genetic and environmental effects, and this resulted in variation of IQ in the same person (Brant et al, 2009).

### **Schizophrenia**

An earlier study on adoption shows that family environment has a less significant influence on child’s mental disorder such as schizophrenia. However, in a study carried out on adopting offspring of biological mothers who have a medical condition of schizophrenia, and that of adopted offspring whom biological parents are free of mental disorder, reports show that there is a significant relation between adopted children of schizophrenic mothers and schizophrenia, while adopted children of parents who didn’t suffer schizophrenia show no sign of schizophrenia in life. Moreover, this supports the general assumption that no matter the theoretical perspectives, the particular environment that a child grew up did not influence risk for a disorder. For instance, if a child’s parent or parents have a medical condition of mental disorder, there is a high tendency that the child will experience the same risk disorder even if he or she is nurtured by biological or adoptive parents (Plomin et al., 1997). Furthermore, evidence from the review of literature on adoption studies showed high proportion and significant correlation

between adoptees of birth parents with schizophrenia, and flaunted schizophrenic-like behaviors. Most research findings on child adoptees whose real parents did not have schizophrenia or having a condition of schizophrenia themselves, shows that only a small proportion of them have a schizophrenic - type condition. Besides, review of current studies on adoption maintained similar findings and reported that a large percentage of proband adoptees showed signs of psychotic symptoms, while other evidence confirmed that little percentage of control adopted children demonstrated the symptoms. Additionally, the adoptees whom his/her natural caregiver experienced schizophrenia will show greater chances of schizophrenia or related associated syndromes if the adoptive relatives have low functioning. Therefore, these and other related findings support the genotype-environment interaction theory, and further lay credence to the general expression that genotype is related to the environmental background (Plomin et al., 1997).

### Discussion

It worth noting that research on genetic has contributed significantly in recent time on the environment, particular, the nonshared situation and the function of genetic in human behavior. It is obvious and evidently established in various methodological approaches on nature and nurture interaction that human behavior and personality is highly influenced by genetic and environmental factors. The general agreement in human development is that any interindividual changes that occur in human behavior as a result of ecological contact is described by the hereditary control of such outcomes. Therefore, genetic factor–ecological interaction gives a better explanation for persons' susceptibility and resilience to ecological dangers in the growth and manifestation of behaviour. At the same time the review of literature on twin, adoption, and family studies offered clear evidence on how heredity and environment contributes to human behavior, personality, and psychopathology. Besides, various reports and analysis of twin, adoption, and family studies raised a large array of topics that support the assertion that the bedrock for each human being varied in structure. For example, in some situation, study showed that genetics seem to dominate; while in other, environment elucidated all. However, in most situations, the strong interaction between the two factors formed the basis of who we are and how we behave.

Moreover, the early experience upon final behavioral features; cultural differences in child-rearing tradition to intellectual and emotional development; mechanism of somatopsychological

relationships; and psychological development of twins from childhood to adulthood, in concert with observations of their social environment all explain heredity and environmental interaction. Though, such approaches are particularly different amid viewing the subjects used, types of psychological functions studied, and particular investigational measures followed, nevertheless, it is very imperative to mention that with age hereditary factors become stable, hence enhance rank-order stability of neuroticism and extraversion and to personality development transversely childhood, adolescence, and young adulthood.

### Conclusion

This paper emphasized mainly on research evidence of the interaction between nature and nurture on behavior. Although the idea of a correlation between heredity and environment are well mentioned in various literature, the debate about various problems associated with heredity-environment issues, including the feasibility of these problems is ongoing till date. However the argument about, "Which one?" and "How much?" is now replaced by more fundamental and suitable question, "How?" genetic influences— as well as environmental issues of an organic environment—differ along a "continuum of implicitness." Therefore, it was established that the more circuitous their relationship with behavior, the wider will be the range of disparity of possible effects. For example, one powerful instance of a range of indirectness is clarified by analyzing metal deficiency that comes as a result of brain damage, moreover other examples illustrate the physical quality linked with social stereotypes. In addition studies show that factors such as deafness, physical diseases, and motor disorders deteriorating at middle points.

Furthermore, reports confirmed that ecological factors which directly influence behavior is well-organized along a continuum of the breadth or stability of effect, as demonstrated by being part of a social class, level of education attained, speech handicap, and acquainted with specific test items. Recent studies give clear facts and method that look at the modus operandi of hereditary and environmental factors. However, the most mentioned among them includes: the explorations of, (a) inherited conditions that explain or trigger differences in behavior among selectively bred groups of animals; (b) associations between physiological variables and personality differences, particularly in the case of pathological deviations; (c) function of prenatal physiological issues in behavior development. At the same time, the evidence confirmed that environmental bases add to this rising continuity and declining stability that develop in old age. Therefore, environmental

influences become visible and cumulate across the life span and lead to the decline of the inherited contribution to differences in neuroticism and extraversion with age, a guide indicating enduring changes in personality owing to ecological effects.

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11/21/2013