CHAPTER II

REVIEW OF LITERATURE
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This section attempts to organise the empirical studies on the belief - behaviour relationship with special reference to belief in heredity or/and environment as determinant of human characteristics, psychophysiological states including pathological states (diseases) and broad behavioural characteristics.

Taking example of intelligence, it has been demonstrated that how ticklish and sensitive the issue that what determines one's intelligence may be? A sample of studies presented here amply demonstrate its academic, social ethnic and political implications. The pattern and flow of scientific evidences time to time have been influencing the belief in heredity environment for human intelligence, revealing its transitory nature. As well the resistance and rejection of the contrary evidence by scientists and laymen alike reveal its relative stability. On the academic front, it is seen that three beliefs prevail and these are propagated by the campleaders - one of those endorse greater role of heredity (Jensen, 1972, Burt, 1971), secondly, those endorse greater role of environment (Kamin 1974) and thirdly the advocates of interactional points of view (Anastasi, 1979; Overton, 1973).

For example, McGufin and Scourfield (1997) have been successful to localise an imprinted gene on the 'X' sex chromosome that influences social
functioning and related cognitive abilities. They also expected the possibility that genes contributing to more commonly studied cognitive abilities such as intelligence will also soon be localised and identified. Yet, Melnick (1999) stated that the belief that genetic factors influence intelligence is beyond dispute must be subjected to revitalized scrutiny and greater subtlety in interpretation.

The polarisation of researchers into different camps is also influenced by other social and scientific forces e.g. Stanislaw (1991) observed that reluctance of psychologists to embrace Darwin stems from the mistaken belief that the evolutionary approach allies with genetic determinism. Cravens, (1988) though has challenged the widespread belief that the impact of evolutionary ideas from culture and science has been greater since the collapse of social Darwinism. He observed that since the time of bitterly debated heredity / environment controversy in 1920's in America which was resolved in 1930's to a synthetic theory of heredity and environment together shaped human nature and culture. The resolution of the issue seems to hold an exhilarating promise. If scientists could explore and even predict human behaviour, they might have restored social control and stability in an age of domestic turmoil. Further, Alper (1998) argued that genetic approach adds little to the understanding of free will and responsibility. It is suggested that with few exceptions, behaviour influenced by genes is no more deterministic
than is behaviour influenced by environment. He concluded on the basis of finding that there is no longer any justification for the belief that genes are the fundamental determinants of behaviour.

Another study which exhibits that how does a scientific evidence contradict a widely held belief by Clark, Telfer et al (1970) attempted to disprove or further substantiate a widely held belief that ‘Y’ chromosome, maleness, testosterone level and aggression are positively related. Their comparative study using man with XYY chromosome and men with XXY chromosome revealed that there is no link between the XYY male and violent criminal behavior. Similarly, McGuffin and Scourfield (1997) provided evidence about the location of a gene that plays a part in behavioral sex differences whereas there is a prevailing belief that gender differences are largely culturally (environmentally) determined.

The citation of studies above again affirm the notion that common men’s beliefs (folk psychology) are a constant source of hypothesizing scientific studies. Disapproval and substantiation of common men’s belief is a part of continuous process of eliminative materialism (Popper, 1992).

On the socio-political front, the belief in regard to heritability of intelligence has been equally important. It has influenced the attitudes and decisions of people in general and politicians in particular. Studies reviewed, those follow substantiate some of the prevalent ideas while also contradict other ideas.
Eysenck (1982) has examined the notion widely held that the findings on controversial issues of scientists tend to endorse the political context (Governmental policies). In his study on "the sociology of knowledge, the genetic interpretation of IQ and Marxist - Leninist ideology", Eysenck found that the belief that people differ in intelligence due to heredity is not unmarxian. Marxist - Leninists did not simply / always contradict right wing on this issue. Eysenck also compared the psychologists studying heritability of intelligence from Russian communist and English - American capitalists and reported that they provided similar data. In another article Eysenck (1982a) suggested that the alleged conformity of political ideology and scientific stance is erroneous and historically untenable. However, belief in genetic or environmental factors in determining human conduct, political and social attitudes are though important. Fletcher (1991) has stressed the importance of belief in heredity / environment for intelligence in the socio-political decisions including economic development plans. Actually such beliefs take the form of ethos in the absence of scientific evidence or sometimes even in the presence of evidence to the contrary. Fletcher, emphasized that supporters of heredity did not deny the importance of environmental conditions for children's development and education. In fact due to unequal educational opportunities and their unequal distribution made hereditarians aware of these inequalities which led them to argue for their remedy. Interestingly, there is no consistent body of work to support the
environmentalists case yet their position became the dominant ethos in both science and educational practice. After World War II, it is the belief in equality which has been taken as a principle of social justice.

In the background of distributed inequalities and the principle of social justice the 'Head Start Project' was launched as a war on poverty as an educational experiment. Zigler and Muenchow (1992) has described the inside story of the project and has termed it as "most successful" educational experiment. Though it is frequently cited as a triumph of the environmentalists, however the true success has been a matter of great debate. Even the matter has been of political significance under the influence of hereditarians camp once the President (of US) thought to decide to stop grants to the Head Start (Moynihan, 1990).

It is not a hidden fact that belief in heredity / environment sometimes has led to social-ethnic conflicts, for example, the dogmatic belief that black and white are genetically equal in cognitive abilities has become more ingrained since the early 1960’s despite increased contrary evidence. Rushton (1984) has reminded the scientific community of their pious duty to openly and forthrightly bring the truth to the masses. In his words, "researcher have a duty to openly and forthrightly declare the genetically based intellectual inferiority of blacks".
Belief in heredity - environment and pathological states

One of the emerging areas in psychology is health psychology, wherein most prolific issue with wider implications for health behaviour has surfaced as 'health belief model' (Becker's health belief model). Though it seems to be a little side of context, yet the purpose to present a brief review here is only to substantiate that the belief in heredity - environment for various ailments should not be very different from belief in heredity/environment for human characteristics.

Sanua (1983) examined the general belief that infantile autism is biologically determined and found that the available evidence is meagre. On the other hand, on the basis of available review of studies he concluded that infantile autism is more prevalent in highly technological countries where there is extensive geographical and economic mobility coupled with nuclearization of family pointing forward environmental determinism. Hill and Bale (1980) attempted to study the perceived locus or belief about the mental health. On the one end of the dimension endogenous belief which emphasize genetic and physiological factors was placed. Another belief was interactional that is mental health problems may arise due to an interaction between an individual and social environment. Similar beliefs about the aetiology of mental illness were also supported by Read and Law (1999).

Even specialists (mental health professionals here) are not immune to the link between aetiological belief and perception of mental 'patients'. For
example, Langer and Abelson (1974) demonstrated that medical model professionals (professionals who give emphasis on genetic/biological causation) perceived a videotape of a 'patient' as more disturbed than did professionals with social learning perspective (professionals who give emphasis on environmental causation). In another study, Kent and Read (1998) have found that biologically oriented professionals were less sympathetic to involving consumers in the planning and management of mental health services than professionals with psychological orientation.

Bish, Sutton and Golombok (2000) studied the factors responsible for taking cervical screening in a population of London females. Among the factors they also included Becker's health belief model as predictor of an intention to be screened. They reported that health belief model was not the best predictor. Blackburn (1996) has studied obesity programme in women among the common themes. He found that belief about biology in genetics was one of the dominant theme for obesity management programme. In fact Blackburn compared several theories for relapse prevention and effort to maintain a desirable weight. An interesting interaction between belief in biology and genetics and self-efficacy emerged critical for efforts to maintain desirable weight and to prevent relapse in the obese population. Those who believe that their obesity is due to their biology and genetics, they had poor feelings of self-control and consequent change in behaviour. Cullinan (1989)
on the other hand emphasized the role of belief in coping and overcoming of genetically vulnerable condition. He said that through counseling and psychotherapy a belief may be developed.

In a series of studies Joseph, J. compared the prevalent beliefs and total weight of evidence from family, twin and adoption studies in favour of the genetic theory of schizophrenia, attention deficit hyperactivity disorder and pellagra (Joseph, 2000, 2000a, 2000b, 2000c). Scientific evidence is inconclusive and Joseph recommends that the genetic theory of schizophrenia, attention-deficit hyperactivity disorder and Pellagra should therefore be rejected until new evidence is presented.

Wolff, Pathare, Craig and Ceff (1996) surveyed the beliefs people held for mental illness. They found that about 39% respondents believed that mental illnesses are caused by heredity factors and 73% of the respondents believed that these can run in families.

**Belief in heredity / environment and specific behavioral contexts:**

Not only in health but belief in heredity / environment may have potent influence on variety of behaviours such as marital decision, child care and even teaching method. Representative studies in these areas are presented.

Ahern, Johnson and Cole (1983) have reported that the marital decisions over the years have been influenced by the changes in the belief.
The phenomena of assortative mating was found to decrease from earlier generations (maternal and paternal grand parents) to the present generation (parents) was seen in Chinese, European and Japanese ancestries. Cross-generational differences were confirmed in European and Japanese ancestries, revealing weakening of belief in heredity for characteristics responsible for educational attainment. On the other hand differences across-generations were non-significant for Chinese ancestry. Authors also interpreted the finding that the change toward decreased homogamy was a secular change, earlier educational attainment was considered to be determined by heredity.

Soodak and Powell (1996) explored the belief of school teachers in regard to their efficacy to perform specific behaviour such as student outcome. Outcome efficacy referred to teachers belief that student outcome were attributable to their actions. Teacher's were found to hold a belief that student’s outcome were also influenced by external factors including heredity. In such case, teachers’ efforts for students’ outcome would become independent. To be explicit, teachers who believe that the outcome of their students if determined by their heredity, they are not likely to put efforts in their teaching.

To show the importance of belief in heredity / environment for parental behaviour, Baumrind's (1993) evidence is very pertinent. He has argued that there is considerable evidence to justify the claim that what normal parents
do or fails to do crucially affects their children’s development. Parents belief in their own effectiveness enhances care giving whereas, causal attributions that assign responsibility for child outcomes to genetic factors that "parents cannot change" undermine parents belief in their own effectiveness. Thus through this belief their care giving behaviour would finally be affected.

**Belief in heredity / environment for human characteristics:**

Enough empirical literature, emphasizing the role of belief in heredity / environment in regard to intelligence, behavioral and physical ailments and behaviors like teacher's efficacy for students outcome, parent's efficacy for children's care and development, self-efficacy for weight control and even marital decisions, reveal that how correct Campbell (1975) was in his APA presidential address wherein he emphasized the belief systems by saying that these are important issues to which psychology should give much greater attention, and that scientific reasons exists for believing that there can be profound system wisdom in the belief system that our social system has provided us with.

Belief in heredity / environment for human characteristics other than intelligence has not been a topic of intensive research even within the literature of belief behaviour domain. A thorough search for the last 30 years psychological-literature through APA's retrieval system revealed only handful of studies which have been reviewed next.
Furnham et al (1985) constructed and used a 48 item questionnaire for measuring belief in heredity / environment for human characteristics. Equal representation to all the six a priori categories (physical characteristics, psychological abilities / skills, personality, beliefs, psychological problems and physical problems / illnesses) was given excepting the two physical categories. Factor analysis revealed that the factor solution was dominated by one factor (eigen value 3.6 accounting 22.6 percent of variance). Apart from body length (loading 0.22) all items had substantial loadings on this factor between 0.36 and 0.61). They administered this measure to a heterogenous population and the results revealed that older and uneducated people were heredity oriented in their belief than younger and educated people. Religious and political orientations were also found to have influence on one's belief in heredity / environment where conservatism explains belief in heredity. They found that agnostics, atheists as well as people with left wing views tend to attribute the origin of most human characteristics in the environment. Authors also reported that people apply a simple additive model with regard to the contribution of genetic and environmental factors and people can be traced somewhere on the continuum which runs from strong heredity belief to strong environment belief.

Meerum Terwogt et al (1993) constructed and used a measure of belief in heredity with respect to 16 diverging human characteristics. These items were selected on the basis of one consideration only. The
characteristics were to be easily discernible and allow for the expression of individual differences with regard to belief in heredity. Apart from this criterion the characteristics were regarded as randomly selected sample from the endless list of possible human characteristics. The 16 items covered in this study were: stubbornness, tendency toward depression, creativity, intelligence, musical ability, energy, perseverance, neatness and orderliness, sportsmanship, collecting mania, body height, linguistic ability, tendency to addiction, fertility, humour and fear of heights. For each item, the subjects were asked to indicate on a five point scale the extent to which they thought the development of the specific characteristic was determined by environmental factor (score 1) or by genetic factors (score 5). Together the 16 items formed a homogenous scale, with Chronbach's alpha = 0.76. They administered this measure to 269 Dutch Caucasian adults (7 males, 172 females) ranging from 21 to 65 years of age. The subjects were divided into three groups. The first group (n=53) consisted of parents who were raising one or more adopted children from third world countries. The second group (n=89) consisted of subjects with no personal knowledge of their genetic father who were raised by their genetic mother and social father. The third group the 'normal' group (n=127) was comparable to the adoptive parents group in that all of the subjects in these groups were raised by both of their genetic parents and to that of the absent father group, in that their children, if they had any, were their own genetic children. Regression analysis
revealed a curvilinear relationship between belief in the influence of heredity and age (the weakest beliefs in heredity were found in subjects around the age of 25) and a negative linear relationship with education (low level of education corresponded to strong belief in heredity). It was also found that parents of adopted children and people with incomplete information about their own genetic backgrounds hold relatively strong beliefs in the influence of heredity.

Singh (2000) constructed and used a measure of belief in heredity / environment for human characteristics. The final scale consist of 20 human characteristics. Factor analysis revealed an absence of general factor. Nine factors emerged with eigen values greater than unity accounting for 58.3% of the variance This suggested that each characteristic or trait should be analysed separately for determining the heredity / environment oriented belief of a person toward human characteristics or traits.

Singh and Shyam (in press, b) constructed and standardized a measure of belief in heredity / environment for human characteristics through a three stage try out on a sample of 3500 subjects. The final scale consisted of 20 human characteristics of different type such as: performing arts, orderliness, emotional instability, egocentricity, linguistic ability, reasoning ability, aggression, anxiety, cleverliness, sociability, altruism, activity / energy, entrepreneurship, general intelligence, creativity, leadership, numerical ability, humour, body weight and bravery. The scale consists of
connotative description of all the characteristics and arranged in the form of checklist subscribed with a three point scale. Items finally selected attest to an endorsement rate of around 0.5 (50%) and discriminate well between heredity and environment believers. The measure shows KR-21 reliability equivalent to 0.68. Normative scaling has been provided on the basis of a sample of 3001 drawn from general population.

Nilsson and Ekehammer (1989) in a study on "social attitudes and belief in heredity: a replication and extension" reported an absence of sex differences in belief in heredity / environment for human characteristics. Knowledge about one’s own genetic background may also have an impact on the belief in heredity / environment. Vankampen et al (1990) have reported that people who have incomplete knowledge about their own genetic backgrounds attribute most of their differences to genes inherited from their unknown natural fathers.

Singh, Shyam and Aruna (2001) examined the belief in heredity / environment to gauge variations among 270 subjects for 22 human characteristics. Level of knowledge was varied by selecting students and teachers, type of knowledge by selecting individuals from bioscience, psychology and other disciplines, ratings were made on a 5 point scale separately for all the characteristics which were pooled and analysed by ANOVA. Sex and level of knowledge were found to be significant sources for variation in belief. Females and students were more heredity oriented in their
beliefs than males and teachers.

Singh and Shyam (in press a) administered a measure of belief in a heredity / environment (Singh and Shyam, in press b) for 20 human characteristics to 3001 subjects from Delhi, Haryana, Uttarpradesh and Rajasthan states. They found that by and large there exists a balanced belief in heredity / environment ($\bar{x} = 40.34 \pm 1.07$). The distribution was a poor fit to the normal distribution as tested by Chi-square test. The distribution was slightly leptokurtic and positively skewed. About 8% of the sample exhibited a consistent belief of heredity or environment while others’ belief varied from trait to trait. The finding also suggested that people can be located on a non-parametric continuous scale of heredity / environment belief. Male and educated subjects were environment oriented in their belief whereas ruralities were heredity oriented in their belief.

Problems, Objectives and Hypothesis

The handful studies conducted in this area were very typical of a trend - to seek determinants / correlates of belief in heredity / environment for human characteristics. The trend was to take the belief as dependent variable. A host of independent variables has been identified varying from demographic variates to attitude regarding politics and God. None of the study could be traced which attempts to take belief in heredity / environment as independent variable and its impact on other domain of behaviour. The absence is striking and notable despite the fact that it has potential to affect
some of the behaviours. For example, Blackburn (1996) demonstrated that feelings of self control in obese people were influenced by their belief that their obesity is genetic and biological. Similarly, Soodak and Powell (1996) and Baumrind (1993) also indicated that belief in heredity - environment for students outcome and children's development influenced the self efficacy of teachers and parents. Thus, the present study was planned by adopting a different strategy and also studying belief in heredity / environment for human characteristics and its impact on the perception of self and others.

Since the problem has been raised in the context of clear gap, the tentative solutions to the problem may be considered exploratory in nature. Moreover, the pluralistic and endogamous social environment of our country (India) offers a vista to assess the extent and state of such belief which may be common, shared in the terminology of Bar-Tal and that groups (social or and economic) may have typical beliefs in heredity / environment. This is the thrust that social perception may be influenced by the belief if others belong to a certain group. The problem is stated as under:

"BELIEF in heredity / environment for human characteristics in relation to social perception"

The concept of belief in heredity / environment has been fully detailed out in Chapter-I and empirical findings in the present chapter revealing several determinants, make it to suggest to identify individual features in relation to varying beliefs in heredity / environment for human characteristics.
Since the purpose of the study is to understand a general belief in heredity and environment, therefore the meaning of the term of human characteristics has been taken as widely as manageable and not a specific characteristics. Thus it includes characteristics on abilities, skills, temperamental traits etc.

To specify, the following objectives were set for the study:

1. To know about the extent (distribution) of belief in heredity / environment for human characteristics.

2. To determine the psycho - socio - demographic determinants (e.g. age, sex, education and social class) of belief in heredity / environment for human characteristics.

3. To examine the effect of heredity - environment belief on values.

4. To study the effect of belief in heredity / environment for human characteristics on perception of self.

5. To assess the effect of belief in heredity / environment on perception of others (i.e. people belonging to low and high social class and living in environmentally enriched or deprived conditions).

Hypothesis:

The following hypotheses were formulated:

1. Belief in heredity / environment for human characteristics would be normally distributed.
2. Perception of self would be significantly different among heredity, environment and balanced believers.

3. Belief in heredity / environment would significantly influence the perception of others i.e. people belonging to different social class and living in environmentally enriched and deprived condition.

4. The interaction of belief in heredity / environment with social class and environmental enrichment would also be significant.