CHAPTER - I
INTRODUCTION

The scientific conceptualization of personality has emerged across the diverse and competitive approaches i.e. psychodynamic, trait, learning, humanistic, cognitive, and biological perspectives, each of which has developed over time and influenced each other. Among these perspectives, the trait approach has contributed most in the emergence of scientific field of personality. Personality theory in terms of traits now has advanced to the status of a ‘normal science’ in the sense of Kuhnian paradigm (Eysenck, 1981; Kuhn, 1962) as the majority of researchers of this field are sharing a set of common beliefs supported by empirical evidences including the relative stability of traits overtime; a significant genetics and biological influences on personality; and relevance of traits in predicting the behaviour in everyday life. Within the trait approach various trait models have emerged which have stimulated various debates and issues including the gene-environment interaction in traits development; traits-situation interaction in determining behaviour; measurement of traits; mechanisms through which traits affect behaviour, as well as the roles of sociocultural factors in moderating the nature of traits (Boyle et al, 2008).

The basic salient of modern trait theory of personality are not new- indeed their origins lie in antiquity (Stelmack and Stalikas, 1991), however, in their contemporary form, have been explored much in 20\textsuperscript{th} century. Historically, personality research and theory may be conceived as having filtered through three main phases: (1) A general literary and observational stage or a philosophical or prescientific phase; (2) A clinical observation phase, in which observations became more systematic than the first phase (grown out of general medicine around 18\textsuperscript{th} century and flourished in the works of Freud, Jung, Adler, and others); and (3) The experimental phase which began in the first quarter of 20\textsuperscript{th} century which led personality psychology established as an identifiable discipline during 1930s as a result of convergence of separate lines of enquire and publication of import works such as by Allport’ (1937) *Personality: a psychological interpretation*; Ross Stagner’ (1937) *Psychology of Personality*; Henry Murray’ (1938) *Exploration of Personality*;
and Kurt Lewin’ (1935) *Dynamic Theory of Personality*. Publication of works of Allport and Stagner is considered the hallmark of formal advent of personality as an important field of investigation. These experimental personality psychologists collaborating with various related disciplines such as Psychoanalysis, Depth Psychology, General Characterology, Mental testing, and Abnormal Psychology led to the establishment of Personality Psychology as a discipline having its own distinguishing characteristics emphasizing the study of (1) Whole person; (2) motivation and dynamics; and (3) individual differences.

The modern trait theory of personality is considered indebted much to three pioneers: Gordon Allport, R. B. Cattell, and Hans. J. Eysenck. Later on, McCrae and Costa (1992), Telegan and Walter (1987), and Zuckerman (1993) have also contributed significantly in refinement and elaboration of trait approach. At the outset, Allport (1937) remarked, “In everyday life, no-one, not even a psychologist, doubts that underlying the conduct of a mature person, there are characteristic dispositions or traits. Allport defined a trait or disposition as “a generalized neuropsychic structure (peculiar to the individual), with the capacity to render may stimuli functionally equivalent, and to initiate and guide (equivalent) forms of adaptive and stylistic behaviour.” It implies that a trait describes the filtering of experience through the self to impose a personal structure on the world. Traits also generate a consistency of response in the service of adaptive and expressive goals. These remain the central assumptions of contemporary trait theory. The phrase ‘peculiar to the individual’ depicts Allport’s predominantly ideographic stance on traits. This view has also been cherished by much of social cognitive personality psychology but trait theory has been more dominated by nomothetic approaches that seek to identify traits that are meaningful for all individuals.

For the exploration of personality traits, Allport used the taxonomy based on the assumption that personality traits can be described in terms of natural language of civilized society. This natural language system Klages, 1926, Baumgarten, 1933, Allport & Odbert, 1936) has been used by various personality psychologists as a source of attributes for a scientific taxonomy. Allport and Odbert (1936), influenced by Baumgarten’s (1933) work in Germany, conducted a seminal lexical study of the personality-relevant terms in an unabridged English dictionary. They selected all the
terms that could be used to “distinguish the behavior”. They included almost 18,000 terms and suggested size of this list seemed “like a semantic nightmare” (Allport, 1937). They also assumed that organizing these thousands of personality attributes into a satisfactory taxonomy would keep psychologists “at work for a lifetime” (Allport, 1937). In the next phase, Allport and Odbert (1936) worked on to bring some order to see the semantic nightmare they had created, in fact, they found out what kinds of person descriptors included in the dictionary from which created four major categories of personality traits relevant to holistic behavior. The first category includes personality traits (e.g., sociable, aggressive, and fearful) which they defined as “generalized and personalized determining tendencies consistent and stable modes of an individual’s adjustment to his environment”. The second category consisted of temporary states, moods, and activities such as afraid, rejoicing, and elated. The third category includes the highly evaluative judgments of personal conduct and reputation such as excellent, worthy, average, and irritating. Finally, the fourth category consists of physical characteristics, capacities and talents, and terms that can not be assigned to any of the other three categories.

Following Allport and Odbert’s (1936) initial classification, Norman (1967) elaborated and divided the domain into seven content categories: stable “biophysical” traits, temporary states, activities, social roles, social effects, evaluative terms, anatomical and physical terms, as well as ambiguous and obscure terms not considered useful for personality description purposes. These seven categories have been explained by Pervin and John (2006) in simplified form as: individuals can be described by their enduring traits (e.g., sociable); by the internal states they typically experience (furious); by the physical states they endure (trembling); by the activities they engage in (screaming); by the effects they have on others (frightening); by the roles they play (murder); and by social evaluations of their conduct (unacceptable, bad). In the last, individuals differ in their anatomical and morphological characteristics (short) and in the personal and societal evaluations attached to these appearance characteristics (cute).

In contrast to Allport who used ideographic approach, R. B. Cattell preferred nomothetic approach in exploration of personality traits (Cattell, 1973; Cattell & Kline, 1977) contending that main attributes of personality may be described in a number of discrete dimensions. Cattell’s personality theory is inextricably linked to
quantitative measurement models based on factor analysis of three sources of data i.e. Life Record or L-data, Questionnaire or Q-data, and Objective Analytic Tests or T-data. Cattell’s traits model is based on the four assumptions. First, trait as a latent construct with casual force, i.e. the source trait should be distinguished from superficial regularities in behaviour or surface traits. Second, personality model should be hierarchical. Third, the personality sphere should be differentiated from other domains of individual differences i.e. ability, motivation, and mood states. Fourth, the influence of traits on behaviour is moderated by situational factors.

The third pioneer in the trinity of trait founders is Hans Eysenck (Eysenck, 1957, 1967) whose debates and discussions with Cattell regarding number of personality traits (Eysenck focused on three dimensions: extraversion, neuroticism, and psychoticism, as compared with 16 or more primary traits and several secondary or higher order factors contended by Cattell led to the number-of-factors issue that has prevailed in the field ever since (Boyle, 2006, 2008). However, this discrepancy in the number of factors has been more apparent than real, since Eysenck and Cattell both have focused on the measurement of different levels within hierarchical trait model. In reality, models of personality of two pioneers should be seen not as mutually contrasting but as complementary and supportive (Eysenck, 1984). Eysenck attempted to understand traits in genetic properties of the brain with a view to link three dimensions of personality (Extraversion, Neuroticism, and Psychoticism) to specific brain systems. Eysenck also pioneered the use of empirical studies to understand the traits-behaviour relationship, and the moderating effects of situational factors in it through controlled experiments. Also central to Eysenck’s model was the empirical investigation of what these days are called consequential outcomes (Ozer & Benet-Martinez, 2006), the relevance of traits to real-life outcomes regarding mental health, academic and work achievements, and social relationships. Eysenck’s specific hypotheses about the biological bases of personality are still issues of debates and arguments, which no trait theorists have denied.

The field of trait theory of personality being initiated and stimulated by Allport, Eysenck, and Cattell has been further explored and contributed systematically by Costa and McCrae (1985) proposing the Five Factor Model (FFM), Tellegan and
Walter (1987) putting forth Seven Factor Model, and Zuckerman (1993) proposing the Alternative Five Factor Model (AFFM). Although various trait models have emerged to explain the nature, structure, development, and measurement of personality, but majority of them are based on some basic assumptions or principles (Mathews et al., 2003; Pervin, 2002; Boyle et al., 2008) which are: (1) traits are relatively stable and continuous dimensional qualities which require a psychometric basis for traits that meet the standard criteria for reliability and validity; (2) there is genetic basis of traits. It has been supported by research evidences in behaviour genetics and molecular genetics. Third principle relates to the generality of expression of traits. Fourth principle of interconnectionism reflects that expression of traits is also influenced by the sociocultural factors.

**Cattell’s Model of Personality:**

Experimental phase of personality investigation though began in the 1st quarter of 20th century but it gained real momentum in 1960s with the foundation of “Society of Multivariate Experimental Psychology” of which R. B. Cattell was one of the torch bearers who contrasted the conservative brass-instrument-concept of experiment. Cattell (1967) defined experiment as “an organized system of gathering data with an organized analysis to follow in terms of fitting some prescribed model”. Such experiment includes both bivariate experiment (in which one manipulates an independent variable and observes dependent variable) and multivariate experiment (in which variables are allowed to vary without control). Manipulation and control are not the criteria of a scientific experiment. Cattell out rightly rejected the use of bivariate experiment and strongly advocated for multivariate approach because it permits an investigator to choose situations in which life itself does its own experiments, and to tease out the exact relationship of “this to that” by sophisticated statistical methods i.e. factor analyses.

Cattell along with other multivariate researchers have argued that in a general strategy of empirical investigation of personality, the cross-sectional personality structures should be explored by factor analytic and other allied methods. It should precede in more bivariate sense to ascertain first the central structures at various ages before investigating the relation of these entities to various influences or effects.
Doing so, various multivariate researchers including Cattel have worked to explore the principal normal and abnormal personality structures in terms of precise factor analytic concepts in different media of observation (e.g. L-data, Q-data, and T-data). L-data or Life Record refers to observations in real-life situations i.e. rating records, and other behavioural evidences. Questionnaires or Q-data involves the statements made by the individual about himself and his behaviour. Objective tests or T-data refers to objective, non-fakeable laboratory type tests or situations in which subject is to respond, and his behaviour is scored on aspects of which he is not aware. Cattell (1957, 1965), in this regard contended that if multivariate research is indeed able to determine the basic structure of personality, then factors or traits should be commonly obtained from L-data, Q-data, and T-data (Media Indifference Hypotheses).

Cattell was prodigious psychometric oriented researcher, listed among top 10 most highly cited psychologists of 20th century (Haggbloom et al., 2002; Boyle, 2008) who led an internationally represented team of researchers in carrying out innovative research pertaining to the structure and assessment of personality and individual differences. Over the period of 70 years of his active research, Cattell published around 56 books and more than 400 research articles/papers. He also authored numerous personality, motivation, and ability tests under the banner of IPAT.

Structure based systems theory by Cattell conceptualizes personality as a system in relation to the environment and attempts to explain complex transactions between the two which lead to the growth of person. His theory implies that sets of traits within person initiate and direct behaviour. These traits are both genetically grounded and modifiable by learning experiences. An adequate theory of personality according to Cattell must consider the ways in which culture and various societal groups influence the individuals and are, in turn, influenced by them (Cattell, 1973, 1980a). For the realization of this goal, Cattell is of the view that structure and process concepts of personality theory must be explored by multivariate research, analyses, and precise measurement.

Cattell’s approach to theory building starts with *Inductive-Hypothetico-Deductive-Spiral* in which investigator observes and describes which leads to
generation of a tentative hypothesis from which he derives an experiment for empirical testing. From the resulting observations or experimental data, a more precise hypothesis is then generated, and new experiment is deduced to test it. Further new data are collected, and the process begins again and continues till theory is built. Cattell’s inductive theory building approach is in contrast to the traditional hypothetico-deductive approach in which the researcher begins with a set of general propositions, deduces a hypothesis, and then tests it through collection of data. Cattell argues that in bivariate experiment, hypothetico-deductive approach is used which artificiality considers bits of human behaviour and ignores the total organism, whereas in multivariate experiment the researcher considers the ‘whole person’ and actually measures all the variables and then abstracts the regularities which exist, through multivariate statistical techniques (Cattell, 1965, 1979). For the study of multiple-variable problems pertaining to human behaviour, Cattell mainly relied on factor analysis and other multivariate statistical techniques. Factor Analysis may include various techniques i.e. R-technique (variables are factored), P-technique (unique trait structure of a single individual is discovered), Q-technique (people are factored than tests), O-technique (attributes of one person are correlated on two occasions), T-technique (test-retest reliability coefficients are factor analysed), and S-technique (test responses of two persons on a series of occasions are analysed).

Cattell defined personality as that “which permits a prediction of what a person will do in a given situation. The goal of psychological researcher in personality is thus to establish laws about what different people will do in all kinds of social and general environmental situations. Personality is concerned with all the behaviour of individual, both overt and under the skin” (Cattell, 1950, 1965). This definition, though appears to be simple in wording, but is deep in meaning; and emphasizes the study of “all” behaviour for the understanding of personality. It contends that meaning of small segments of behaviour can be fully understood only seen within larger perspective of the entire functioning in organism. Mathematically, this definition can be stated as: R=f (S, P).

Here, the behavioural response (R) of a person is a function (f) of the situation (S) confronted, and the individual’s personality (P). Cattell’s sticking to mathematical
and quantitative emphasis on multivariate investigation appreciates the meaning of his dictum, “science demands measurement”.

Cattell has conceptualized personality as a complex and differentiated structure of traits, with its motivation mainly dependent on a subset of so-called dynamic traits. Trait, in Cattellian model, refers to an inferred mental structure that accounts for the consistency of observed behaviour, comes in several varieties, and accounts for both structural and dynamic aspects of personality. Traits being relatively permanent and broad reaction tendencies, serve as building blocks of personality. Some traits may be common to all people, others unique to an individual; some determined by heredity, other by environment; some relate to motives (dynamic traits), and others to ability, and temperament (Cattell, 1965). Central to Cattell’s model is the distinction between surface and source traits. Surface traits represent clusters of manifest overt behaviours that appear to hang together and do not necessarily have a common cause. In medical terminology, surface traits can be labeled as ‘syndromes’. Surface traits can be produced by interaction of source traits, and generally tend to be less stable over situations and overtime. Source traits, in contrast, are the basic underlying structures representing the unitary dimensions or functions that ultimately determine the consistency in a person’s observed behaviour. In effect, source traits exist at a ‘deeper level’ of personality and act as the causes of behaviour in diverse domains over an extended period of time. Cattell (1950) considers source traits to be more important than surface traits because....... the source traits promise to be the real structural influences underlying personality, which it is necessary for us to deal with in developmental problems, psychosomatic problems, and problems of dynamic integration..... as research is now showing, these source traits correspond to real unitary influences----- physiological, temperamental factors; degrees of dynamic integration; exposure to social institutions----- about which much more can be found once they are defined (Cattell, 1950).

A given trait may represent the outcome of the operation of environmental factors, hereditary factors, or mixture of the two. The source traits have been categorized into those reflecting genetic and more broadly constitutional factors, and those derived from environmental factors. Traits resulting from the operation of
environmental conditions are called *Environmental mold traits*; and those that reflect hereditary factors are called *Constitutional traits* (Cattell, 1950). Cattell (1960, 1982) has developed a statistical technique called *Multiple Abstract Variance Analysis* (MAVA) to assess the degree to which various traits are determined genetically or environmentally. The method is based on complex comparisons among people of the same family who were raised together and those who were raised apart, as well as the numbers of different families (i.e. unrelated people) who were raised together and who were raised apart. MAVA permits researchers to make more precise determination of the contributions of genetic and environmental factors to the development of traits than do other methods. Results from MAVA can also be used for effective treatment of mental disorders (Cattell, 1962).

Source traits can also be categorized in terms of modality through which they are expressed i.e. ability traits, temperamental traits, and dynamic traits. **Ability traits** refer to the person’s skills in dealing with problematic and complexity of a given situation with speed and accuracy. Intelligence is an ability trait in Cattellian model. Cattell (1963, 1982, 1987) has provided an hierarchical model of intelligence comprising about 20 primary abilities and a number of second-stratum ability factors mainly in T-data by using Culture-Fair Tests (Cattell, 1941) and Comprehensive Ability Battery (Hakistan and Cattell, 1982). Cattell and colleagues have reported that both fluid (gf) and crystallized intelligence (gc) factors are accompanied by a number of important second-stratum factors such as *Memory Capacity* (Gm), *Perceptual Speed* (Gps), *Retrieval Capacity* (Gr), *Visualization Capacity* (Gv), and *Auditory Organization* (Ga). **Temperamental traits** refer to stylistic tendencies which are concerned mainly with constitutional aspects of response such as speed, energy, or emotional reactivity. Cattell (1957, 1959, 1965) located 12-15 L-data temperamental factors of personality labeled as A, B, C, etc. in decreasing order of variance magnitude. The obtained L-data factors were used to determine whether compared factors could be found in Q and T-data which led to the development of 16PF and Objective Analytic Tests. Primary factors obtained in L, Q, and T-data were indexed with prefix UI (L), UI (Q), and UI (T) respectively. Cattell also developed and employed Universal Index in which numerical indexing of personality factors was made (e.g., UI L 1 To15; UIQ1 to 16; UIT 1 to 62) because the obtained factors were
numerous enough to exhaust the alphabets. **Dynamic traits** refer to the person’s motivation and interests which activate and direct the person toward particular goals. A dynamic trait is something that has to do with reactivity to stimuli with energizing the organism, driving to action, and with striving for goals. Like temperamental source traits, Cattell (1950, 1965) investigated the dynamic structure in terms of ‘motivational sphere’ and contended that there are three types of dynamic traits derived mainly from T-data----Attitudes, Sentiments, and Ergs.

Attitudes refer to specific interests in a specific course of action toward certain objects in a given situation; and are elemental “bricks” for dynamic structure (Cattell, 1950, 1957, 1965; Cattell & Child, 1975). The strength of an attitude reflects in the strength of a course of action, or tendency to a course of action in response to a stimulus. Cattell and coworkers in a series of studies using 68 different devices have obtained five attitude component factors labeled as (1) Alpha factor, (2) Beta factor, (3) Gamma factor, (4) Delta factor, and (5) Espiton factor. In later researches, two additional factors were identified and labeled as (6) Zeta factor, and (7) Eta factor. Out of these two second order factors were indexed Integrated (conscious) aspect of attitude (I) and Unintegrated aspect of attitude (U). Discrepancy between I and U indexes the maladjustment or conflict in the individual.

In Cattell’s theory Erg is a constitutional dynamic source trait defined as “an innate psychophysical dispositional which permits its possesses to acquire reactively (attention, recognition) to certain classes of aspects more readily than others, to experience a specific emotion in regard to them, and to start on a course of action which causes more completely at a certain specific goal activity than at any other” (Cattell, 1950). Ten ergs have been factor analytically established indexible in MAT (Cattell and Child, 1975).

A sentiment is an environmental mold dynamic source trait, parallel to Erg, except that it is the result of experiential and sociocultural factors. Cattell and colleagues have identified about 27 Sentiments labeled as $S_1$ to $S_{27}$.

For the explanation of structural and organized relationship among dynamic traits i.e. attitudes, sentiments, and ergs, Cattell (1950) proposed the concept of “Dynamic Lattice” which postulates that dynamic traits are organized in complex
ways within the cognitive and motivational structure of the organism. These dynamics traits are interrelated in a pattern of subsidization i.e. these are supplementary to each other. Dynamic lattice describes a complicated and after bewildering intervening of interests, attitudes, sentiments, goals and drives. Changes in dynamic lattice can occur as a result of person’s mood or emotional states i.e. a person’s traits, attitudes, sentiments, interests and even goals can be modified by such states as fatigue, guilt, anxiety, depression, arousal, extraversion, stress, and regression indexible in 8SQ (Cattell & Kline, 1977). Changes in dynamic lattice can also be produced by changes in the person’s environment i.e. a serious set back in business may result into a drastic change in a person’s life style. Cattell has integrated all attitudes, interests, ergs, and sentiments by postulating a master motive i.e. Self-Sentiment which coordinates different attitudes, sentiments, and interests of the persons and also regulates the expression of ergs (Cattell & Horn, 1963).

In addiction Cattell also provided an account of origin and characteristics of long-circuited means-end traits and metanergic behaviour. It states that some forms of behaviour are more satisfying than others, and that some behavioural habits (even boring or repellent) are acquired because these are the only way to have more satisfying actively. For example, school children acquire the trait of being punctual in order to get approval and to avoid punishment. Similarly, people acquire industrious habits of toil in order to earn and eat. Long circulated or detour means-end activities usually arise in the last resort from the blocking of the direct path to the satisfaction favored by the innate drives. Rewards and punishments contribute in inducing such activities and behaviours in human beings. The civilized and cultured behaviour are the best examples of long-circulated behaviour.

Cattell (1979) put forth ‘econetic model’ explaining the role of environmental factors in predicting the behaviour which postulates that human behaviour is the result of a complex and subtle interplay behaviour traits and situations. Cattell constructed a taxonomy of situations or environments (Environmental Sphere) for understanding the traits-environment interactions. He emphasized the need to develop econetics (Study of ecology) for comprehensive understanding of contribution of socio-cultural situations in determining various aspects of behaviour. Cattell (1979, 1980a)
contented that complexity of detrimental effects of situations on behaviour can be predicted by means of *dynamic calculus* which consists of a set of *specific equations* that take into account the multiple traits that influence behaviour as well as the impact of environment. The general form of equation in this regard is:

\[ R = (b_1 A_1 + b_2 A_2 + \ldots + b_n A_n) + (b_1 B_1 + b_2 B_2 + \ldots + b_n B_n) + (b_1 C_1 + b_2 C_2 + \ldots + b_n C_n) + (b_1 k_1 + b_2 k_2 + \ldots + b_n k_n) \]

Here, \( R \) is the performance or response of an individual in a given situation. It is determined by a weighted combination of (1) person’s source traits \( (A_1, A_2, \ldots, A_n) \); (2) person’s states and moods \( (B_1, B_2, \ldots, B_n) \), and social and cultural meanings \( (C_1, C_2, \ldots, C_n) \) of the situations for the person. It can also include the weighted combination of any other factors \( (K_1, K_2, \ldots, K_n) \). Here, \( b_1, b_2, \ldots, b_n \) are the weights.

In addition to personality traits, Cattell has suggested that states, roles, and sets can also influence the behaviour, eight states i.e. anxiety, extraversion, depression, arousal, fatigue, stress, regression, and guilt have been factor analytically identified (Cattell, 1973) indexible in 8SQ.

Cattell has attempted to study personality development at descriptive level by charting the change in personality structure ones the life span as well as at theoretical level in terms of genetic and environmental influences involved, and the laws of maturation and learning. Cattell and colleagues have conducted factor analytic studies at both adult and child levels to develop measures capable of indexing the same personality factors at different age levels. For the verification of hypothesis that same / similar factors will be found at ages from 4 years to adulthood, Cattell developed and used Preschool Personality Quiz (PSPQ; 4-6 years), Early School Personality Quiz (ESPQ; 6-8 years), Child Personality Questionnaire (CPQ; 8-12 years), High School Personality Questionnaire (HSPQ; 12-15 years), and the adult 16 PF; but could not find the same trait structures across the age levels.

Cattell and associates have attempted to examine the relative effects of genetic and environmental influences on personality traits using MAVA (Cattell, 1960, 1982) and based on the findings Cattell inferred that in general heredity-environmental correlations tend to be predominantly negative (law of coercion to the biosocial mean) depicting that socially typically exert pressure on genetically different individuals to conform to the social norms.
Cattell (1979, 1980, 1985, 1990) distinguished different kinds of learning which play important role in personality development (Structured Learning Theory): classical conditioning, instrumental or means-end learning, and integration learning; of these, classical conditioning mainly contributes in attaching emotional responses to environmental cues; instrumental conditioning plays in building up the dynamic lattice, and integration learning contributes in the formation of self, and superego sentiments. Fourth type of learning is ergic goal modification with which a person learns to modify the ergic goal as well as path to goal. Fifth type of learning is energy saving which refers to the process of draping unnecessary steps in learned behaviour. The process of personality development is further significantly intervened by maturation which may delay the fully blown expression of genetic influences on traits. Cattell (1979, 1985) has explained the effect of environment on personality through his econetic model which proposes that any psychosocial event has “five signatures”; person, stimulus, act, ambient situation; and the observer. Interaction of these can be studied in “Data Relation Matrix”.

Cattell has regarded source traits as the fundamental building blocks of personality. Surface traits can be discovered through subjective methods but source traits can only be discovered through sophisticated factor analytic method. So, Cattell (1959) attempted to explore the source traits across three media of observations i.e. L-data, Q-data, and T-data; and hypothesized that same source traits can be extracted by these different observations (media indifference hypothesis). L-data includes all the aspects of human behaviour which fall in adjectives of dictionary, and Cattell searched these adjectives what he called the “Personality Sphere”. From these adjectives, he reduced/clustered synonym words those were best descriptors of individual’s behaviour. The list of these reduced words named as “Reduced Personality Sphere”. Subjects were rated on these reduced personality adjectives, and factor analysis (cluster analysis) was applied to obtain the source traits; and 12 to 15 L-data factors have been found which sequenced in decreasing order of variance magnitude. Singh and Verma (2006) suggested that these obtained factors served the double function of (a) providing a set of measureable personality dimensions to be integrated into a systems, and (b) furnishing hypotheses to aid the systematic extension of personality research into the Q and T-data. Later on, these factors
(obtained from L-data) were compared with extracting factors from Q and T-data; also helped to the development of 16 PF and OATB (Objective Analytic Test Battery). Cattell (1957a) also prescribed “nine methodological points for good ratings” which are: (i) implicit time sampling, (ii) time length, (iii) behavioural definition, (iv) comparable sigmas, (v) avoidance of role relations, (vi) democratic judgement, (vii) splitting stereotypes and halloos, (viii) comparable means for judges, and (ix) independence of judgement. However, L-data factors named as: Cyclothymia v/s Schizothymia: A or UI (L) 1; Low v/s High Intelligence: B or UI (L) 2; Ego Strength v/s Proneness to Neuroticism: C or UI (L) 3; Excitability Insecurity: C or UI (L) 4; Dominance v/s Submissiveness: E or UI (L) 5; Surgency v/s Dissurgency: F or UI (L) 6; Superego Strength: G or UI (L) 7; Parmia (Parasympathetic Immunity) v/s Threctia or Threat Reactivity: H or UI (L) 8; Premsia v/s Haria: I or UI (L) 9; Coashtenia (or Thinking Neurasthenia): J or UI (L) 10; Protension (or Paranoid Trend) v/s Inner Relaxation: L or UI (L) 12; Autia v/s Praxemia: M or UI (L) 13; Shrewdness v/s Naivete: N or UI (L) 14; and Guilt Proneness v/s Confidence: O or UI (L) 15.

Like L-data, Cattell elaborated his work to acquire the similar source traits from Q-data. For this, he developed number of Q-data instruments i.e. Pre-school Personality Quiz (PSPQ) for ages 4-6 years, Child Personality Questionnaire (CPQ) for ages 6-8 years, High School Personality Questionnaire (HSPQ) for high school students, and 16PF for adults. He also developed Clinical Analysis Questionnaire to assess the abnormal personality source traits. Mainly, he focused for the development of 16PF; and for this, thousands of items were written and administered to large groups of normal subjects. Factor analysis was applied and 23 primary factors were extracted; from these 23 factors, only 16 factors were retained. Cattell observed that from these 16 factors 12 were similar those found in L-data observation, and 4 factors were additional (Q₁, Q₂, Q₃, and Q₄). However, these 16 primary factors (which are prescribed in 16PF) labeled as: A, B, C, E, F, G, H, I, L, M, N, O, Q₁, Q₂, Q₃, and Q₄. Moreover, Cattell (1973) extracted the eight second order factors using by observations of fourteen studies which were based on adults with 16 PF. He named of these second order factors as: (i) Exvia, (ii) Anxiety, (iii) Cortertia, (iv) Independence, (v) Discreteness, (vi) Subjectivity, (vii) Intelligence, and (viii) Good Upbringing.
More recently, Cattell and Mead (1993) explored five global/higher order factors which are indexed in 16 PF-Fifth Edition (also called international edition). These five global factors are as: *Extraversion* (EX); *Anxiety* (AX); *Tough-Mindedness* (TM); *Independence* (IN); and *Self-Control* (SC).

Cattell started work to explore the similar personality source traits/factors (as in L, and Q-data) through developing the T-data measures-objective tests, including laboratory measures (Singh & Verma, 2006). In the view of this robust data collection technique, work has been started by Cattell (1948a) and his co-workers in the laboratory of Personality and Group Analysis at the University of Illinois, and by Eysenck (1953c) and his co-workers at the Institute of Personality, Moudsley, Hospital, London. Here, the main aim of Cattell was to avoid the individuals’ biases which they do in Q-data measures. In simple, T-data measures are miniature situations/tasks in which subjects do responses, and their responses are observed and measured; and subjects’ can’t understand that which aspects of behaviour are measuring. Singh and Verma (2006) concluded that these three media of observations i.e. L, Q, and T-data are having their own properties, but Cattell and others claimed that same personality traits are found across these three media of observations. However, Cattell developed the comprehensive battery of these objectives tests—“Objective Analytic Test Battery”. He explored 62 primary factors including the ability (1 to 15), temperament (16 to 35), and dynamic factors (36 to 62). The primary personality source (temperament) traits can be named as: *Narcistic Ego* v/s *Secure Disciplined Unassertiveness* (UI 16), *Timid Distrust* (Inhibition-Timidity) v/s *Trustingness* (UI 17), *Manic Smartness* v/s *Passiveness* (UI 18), *Independence* v/s *Subduedness* (UI 19), *Comention* (Cultural Conformity) v/s *Objectivity* (UI 20), *Exuberance* v/s *Supressibility* (UI 21), *Cortertia* (Cortical Alertness) v/s *Pathemia* (UI 22), *Mobilization of Energy* v/s *Regression* (UI 23), *Anxiety* v/s *Adjustment* (UI 24), *Realism* v/s *Tensinflexia* (Psychotic Tendency (UI 25), *Self-realization* (Narcistic Self-sentiment) v/s *Homespunnness* (UI 26), *Unmovedness* (Susceptible Apathy) v/s *Involvement* (UI 27), *Superego Asthenia* v/s *Rough Assurance* (UI 28), *Determined (whole hearted)* *Responsiveness* v/s *lack of will* (UI 29), *Mature Solidness* v/s *Dissofrustance* (UI 30), *Wariness* v/s *Impulsive Variability* (UI 31), *Exvia* (Extraversion) v/s *Invia* (Introversion) (UI 32), *Reactive Dismay* (Pessimism) v/s
Sanguine Poise (UI 33), Inconautia (Impracticalness) v/s Practicalness (UI 34), Stolparsonmia (Somnolence) v/s Excitation (UI 35), and Strong Self-sentiment v/s Weak Sentiment (UI 36). Moreover, he also extracted seven second order factors named as: Tied Socialism v/s Absence of Cultural Introjection (Ti), Expansive Ego v/s History of Difficulty in Problem Solving (Tii), Temperament Ardor v/s Apathy (Tiii), High Self-consciousness v/s Low Self-consciousness (Tiv), History of Inhibiting, Restraining Environmental Laxness (Tv), Narcistic Development v/s Responsiveness to Environment Discipline (Tvi), and High Tension to Achieve v/s Low Tension to Achieve (Tvii).

**Eysenck’s PEN Model:**

Hans Eysenck is another major figure among the trait psychologists (Boyle, 2006). Eysenck’s PEN model deserves a good evaluation for its contribution to the development of personality psychology as well as the scientific process for evaluating theories with experimental evidence. For understanding individual differences and nature of personality, Eysenck worked on answering two questions. The first is static, descriptive, and non-causal which concerns the descriptive analysis of those types of behavior including terms as personality, character, and temperament; the second is concerned with the more dynamic, causal problem of why a particular individual behaves in the way he does, shows certain traits of personality rather than others, or demonstrates one kind of ability rather than another (Eysenck & Eysenck, 1985). The first question led him to the investigation of the taxonomy/classification of individual’s behaviors; and second to the investigation of the dynamics of human behavior. Eysenck adopted Hypothetico-deductive method in exploration of personality dimensions. Eysenckian approach is, to begin with, a well developed hypothesis about some basic traits, followed by the precise measurement corresponding to traits. With a view to develop a scientific theory of personality, Eysenck suggested that two approaches must be integrated: (1) identifying the main dimensions of personality; (2) diverse means of measuring them, and linking them with experimental, and quantitative procedures (Eysenck, 1947; Eysenck, 1997a). Eysenck’s approach appears to be more theoretically anchored than of Cattell as is clear in Eysenck’s assertion that no more than three broad dimensions are required to
account for most of variance in personality. Like Cattell, Eysenck made use of factor analysis in exploration of dimensions of personality.

In his PEN model Eysenck defined personality as “a more or less stable and enduring organization of a person’s character, temperament, intellect, and physical which determines his unique adjustment to the environment. Character denotes a person’s more or less stable and enduring system of conative behavior (will); temperament his more or less stable and enduring system of affective behavior (emotion); intellect his more or less stable and enduring system of cognitive behavior (intelligence); and physique, his more or less stable and enduring system of bodily configuration and neuroendocrine endowment (Eysenck, 1970). This definition emphasizes traits (stable and enduring characteristics) which clustered together are organized as types.

It explains the difference between trait, which refers to a set of related behaviors that repeatedly occur together; and type which refers to a higher-order construct comprising a set of correlated traits (Eysenck & Eysenck, 1985). This differentiation has been explained in Eysenck’s (1981, 1988, 1990) hierarchical organization of personality. In this hierarchical structure, the bottom level contains specific responses, such as talking before class on a single occasion; the second level contains habitual responses, such as talking before class on a regular basis; the third level contains traits, which are related sets of habitual responses; and finally, the highest level of generality contains types or related sets of traits (Boyle, 2008). This hierarchical analysis by Eysenck appears to be equivalent to Murrey’s distinction between needs and aims, Costa and McCrae’s Big Five traits and facets, Cattell’s distinction among surface traits, source traits, and second-order factors; and Zuckerman’s Alternative Five Factor factors and their facets.

Being influenced by Galen’s theory of four temperaments, Eysenck (1972) proposed the description of personality in terms of three basic dimensions: Extraversion v/s Introversion, Emotional Stability v/s Instability or Neuroticism, and Psychoticism v/s Impulse Control. He also claimed in his PEN model that these three dimensions or super factors are based on “constitutional, genetic or inborn factors, which are to be discovered in the physiological, neurological, and biological structure
of the individual” (Eysenck & Eysenck, 1985). However, at the initial level of taxonomy of personality, Eysenck (1957) proposed two broad dimensions of personality: Introversion v/s Extraversion, and Neuroticism v/s Emotional Stability. He suggested that introverts have a low ratio of inhibitory to excitatory cortical process, and extraverts have a high ratio. Moreover, if excitatory neural process can be understood to facilitate the acquisition of conditioned responses, then a combination of Clark Hull’s learning model and Eysenck’s model predicts that introvert’s nervous system permits them to condition more readily than extraverts (Boyle, 2008).

In his later research, Eysenck (1967) found that his inhibitory theory is inadequate, so replaced it with the arousal theory. This description was more specific than the earlier, especially in the context of physiological mechanisms underlying individual differences in personality. This new version is based on Ascending Reticular Activating System (ARAS) which was actually proposed by Moruzzi and Magoun (1949). In terms of ARAS, extrovert individuals are identified largely with differences in levels of activity in the cortico- reticular loop, whereas introvert individuals are characterized by higher level of activity than extraverts and so are chronically more cortically aroused than extraverts (Eysenck & Eysenck, 1985). Due to higher arousability, introverts are more sensitive to external stimulation and so more easily overestimate than extraverts. The resulting tendency for introverts to avoid excessive stimulation and for extraverts to seek stimulation led Eysenck to designate introverts as ‘stimulus shy’ and extraverts as ‘stimulus hungry’ (Boyle, 2008). In short, a person with high extraversion would be sociable, popular, optimistic and rather unreliable, whereas a person with low extroversion (introvert) would be quiet, introspective, reserved, and reliable.

The second broad dimension is Neuroticism v/s Emotional Stability. A person with high neuroticism is anxious, worried, moody, and unstable, whereas a person with low neuroticism is calm, even-tempered, carefree, and emotionally stable. Regarding the individual differences in neuroticism, Eysenck (1967) argued that it may be interpreted in terms of differential thresholds for hypothalamic activity, and to differences in responsivity of the sympathetic nervous system, with high neuroticism
scores associated with greater responsivity. Regarding the physiological basis of neuroticism, the high and low level of neuroticism can be measured in terms of skin conductance, muscular tension, heart rate, blood pressure, EEG, and breathing rate (Eysenck & Eysenck, 1985). However, its meaning is not simply that high and low neuroticism scorers will always differ with respect to autonomic activation, but autonomic activation creates an emotional reaction to a given situation. Hence, there will be no feelings of neurotic behavior in relaxed conditions.

In PEN model, third broad dimension of personality is *Psychoticism v/s Impulse Control* which he proposed in his later researches pertaining to descriptive system of personality. Eysenck (1970a) stated that regarding the psychoticism there are two questions: first is we must decide whether there is a continuum from normal to psychotic or whether schizophrenia, manic-depressive illness, and other functional disorders are really states which are qualitatively different from normality; and second question is whether this continuum is collinear (identical) which means normality to neurosis, and neurosis to psychotic, as Freud summarized, with neurotic disorders being intermediate between normality and psychosis (continuum of regression) or whether two separate continua are required. To address these questions Eysenck, based on several studies, favored the continuum theory. Eysenck (1992a) provided empirical evidence to support this “dimensional or continuity hypothesis” and described three main points after studying psychoticism: (1) Psychotic symptoms and illness do not form completely separate diagnostic entities, are unrelated to each other but are genetically related; and form a general cluster with severity of illness and major distinguishing markers. (2) Psychosis is not a separate diagnostic entity which is categorically separated from normality; it is merely an extreme along a continuum of abnormality shading into schizoid personality, ‘spectrum’ disorders, psychopathy, and personality disorder, criminality and alcoholism, and average types of behavior right to other extreme of empathy, altruistic, and selflessness. (3) This continuum is co-linear with concept of psychoticism, embodied (however imperfectly) in the P scale of the EPQ, and also in a number of “Schizotype’ constructs and scales all the elements of this theory are empirically stable, and have been so tested on numerous occasions.
Eysenck elaborated his PEN model based on the principle of “aggregation” which states that measures will have higher reliability if they are comprised of many items (Eysenck, 1990) as in PEN model superfactors/dimensions are comprised with many different traits, habits, and responses; and thus reliability of measurement is increased. The PEN model also depicts trait-state distinction contending that traits are semi-permanent personality dispositions, identified by means of correlational (factor analytic) studies, determined by hereditary factors, and measureable by means of questionnaire data, ratings, objective psychological laboratory tests, and psychophysiological measures; whereas states are “transient internal conditions” which are produced through interactive influence of traits and situations (Eysenck, 1985). The dimensions/superfactors of extraversion, neuroticism, and psychoticism at the top level of the hierarchy are stable, whereas behaviors such as talking with a friend on a single occasion at the bottom of the hierarchy are changeable across the time and situations. So, the distinction among the levels is very important for the analysis of personality in the PEN model.

Review of literature pertaining to PEN model reveals that all the three superfactors/dimensions of personality appear to be universal. It is assumed that if these three superfactors are associated with biological importance, then they would also appear not only in human behavior but also in the behavior of animals, particularly in mammals. Although, a few studies have been conducted in the context of animals behavior. Eysenck (1985, 1992a) reported that these superfactors are not just patterns of behavior to be observed in Western Society (particularly Europe and the United States of America), rather are cross-culturally well established empirically. Such universality has been demonstrated using by Eysenck Personality Questionnaire (EPQ). Although, the supporting evidences of PEN model are substantial but there are also some anomalies which need to be cleared up. For example, the trait of impulsivity was originally under the superfactor of extraversion in the Eysenck Personality Inventory (EPI), but later it was moved to psychoticism in the Eysenck Personality Questionnaire (EPQ; Eysenck & Eysenck, 1985). Some researchers, such as Gray (1981) disagreed with this removal from extraversion and strongly believe that impulsivity as well as anxiety should be treated as uniquely important.
Critical review of PEN model depicts that it has contributed in the study of personality in three distinctive ways. First of all, it combines both descriptive and causal aspects of personality in one theory (Eysenck, 1997; Stelmack, 1997). It characteristically distinguishes the PEN model from other trait theories particularly Five Factor Model (Costa & McCrae, 1992a, 1992b; Eysenck, 1991, 1992a, 1992b). By providing casual explanations in addition to the description of personality, the PEN model is supported by more credible evidence than purely descriptive models. The combination of two important aspects of personality in one theory (PEN model) makes it possible to understand personality as whole.

Secondly, PEN model provides comprehensive description of personality being hierarchically organized at four levels with clear distinction among these levels. This characteristic has played another critical role in the comparison of PEN model with other trait theories. Even though, Costa and McCrae’s (1992a) five factor model is also hierarchical; their model seems to mix up lower-level factors with higher level superfactors (Eysenck & Eysenck, 1985; Eysenck, 1991, 1992b). The big five dimensions of agreeableness and conscientiousness are traits at the third level that combine as part of superfactor of psychoticism at the top level of the PEN model. For understanding the very nature of personality fewer independent factors are better than many factors overlapping one another. Moreover, the five factor model includes “intellect” or “openness” at the top level (Costa & McCrae, 1992a). But PEN model draws a clear line between temperament and cognitive ability and treats intelligence differently. It does not mean the PEN model totally excludes intelligence from personality, rather advocates the more common view that intellectual processes can be discriminated from emotional ones” (Eysenck & Eysenck, 1985).

Lastly, PEN model appears more comprehensive because of its experimental approach to the study of personality which makes the model more testable. Consequently, the PEN model is likely “to generate more specific predictions because knowledge about the functioning of the specified physiological structures is available” (Eysenck & Eysenck, 1985). So, other researchers can go through the scientific process to evaluate the theory through various experiments. Despite some criticisms (Anderson & Revelle 1994; Gray, 1981; Revelle et al., 1980; Stelmack, 1990; Zinbarg & Revelle, 1989), the experimental approach of the PEN model serves as a good role

Eysenck (1990) argued that both *heredity* and *socialization* interactively determine the development of personality traits. He stated that individuals are born with some specific predispositions (traits), and these predispositions may be filtered through the interactions of biological (inherent) factors and demands of society. These predispositions are more biologically rooted than socialization. Regarding the biological bases of personality, Eysenck has drawn three conclusions as under: (1) the same three personality orientations (Extraversion, Neuroticism, and Psychoticism) are found universally, despite the unique social and cultural factors that force individuals in different national groups to behave in ways consistent with their national affiliations; (2) these predispositions show stability within given individuals over long periods of time, during which a variety of experiences occur without appreciably modifying basic responses; and (3) empirical twin studies supported the genetic hypothesis.

Eysenck and colleagues have studied the stability of three dimensions of personality by using different versions/adaptations of EPQ on males and females across the cultures/nations. Findings have revealed the emergence of same factors across the nations/cultures, gender, and age. More specifically, Eysenck (1990) suggested that across the gender, these primary dimensions have been found in 35 nations, including Greece, France, Spain, Hungry, Japan, Egypt, Iran, Iceland, Sri Lanka, Uganda, the Commonwealth of Independent States, and the United States. Similarly, the same primary factors have been found across the age, by using Junior Eysenck Personality Questionnaire (Eysenck, 1965) in different cultures like Hungry, Spain, Japan, Singapore, and Greece etc (Eysenck & Eysenck, 1985). Longitudinal studies have also supported the stability of these primary personality dispositions (Rachman, 1969). Several identical and fraternal twin studies have also depicted that personality traits are biologically determined significantly.

Eysenck (1985) found that personality traits develop through the mediating role of socialization. The process of socialization consists of an individual’s learned or conditioned responses (CRs). Here, every individual may be punished and rewarded for his/her behaviour in the perceptive of societal expectations. The
important things is that in which degree, an individual learns the rules of society. Eysenck and Eysenck (1985) reported that introverts learn the rules more quickly than extroverts; because introverts are high on cortical arousal than extroverts. Interestingly, introverts are always ready to create very strong consciences; for this they feel guilt and anxiety due to violating the rules of society, that’s why they go to crime and other antisocial activities because of some underlying causes such as stressful conditions, obsessive-compulsive, and phobic reactions or depressive behaviour (Eysenck, 1965). Studies have also revealed that psychoticism and intelligence both are strongly related with antisocial and criminal behaviour (Eysenck & Eysenck, 1985; Eysenck & Gudjonsson, 1989). Here, Eysenck argued that low IQ is responsible for criminal behaviour. Eysenck (1982) has conclusively stated that for the determination of personality dispositions, heredity is very important, but some modification is possible by environmental influences.

**Five Factor Model: A More Systematic Taxonomy of Personality**

The systematic taxonomy of personality traits started with contribution of various psychologists such as Klages (1926), Baumbergarten (1933), and Allport and Odbert (1926) when they realized that natural language is the actual source of personality description. For this, they extracted all the relevant personality descriptors from dictionary being guided by the lexical hypothesis. Allport (1937) argued that most of the socially relevant and salient personality characteristics are encoded in the natural language. However, this earlier trait taxonomy has been used by Cattell (1943, 1945a, 1945b), Tupes and Christal (1961), and some other psychologists; what structure they obtained provided empirical ground for the emergence of five factor model of personality. Cattell reduced the personality descriptors in a more systematic way and finally used 35 variables which became the base of five broad dimensions of personality. This list of 35 variables was used to examine the dimensional structure of trait ratings. Fiske (1949) used a total 22 out of 35 variables and factor structures derived from these self-ratings, ratings by peers, and ratings by psychological staff members were highly similar and resembled with what later came to be known as Big Five. To verify the factor structure provided by Fiske, Tupes and Christal (1961) reanalyzed the correlation matrices from eight different samples consisting of airmen, who were not having more than high school education to first-year graduate students,
ratings by peers, supervisors, teachers, or experienced clinicians in settings as diverse as military training courses and sorority houses. They also found “five relatively strong and recurrent factors and nothing more of any consequence” (Tupes & Christal, 1961).

Furthermore, these 35 variables were used by other psychologists (Norman, 1963; Borgatta, 1964; Digman & Takemoto-Chock, 1981) and also extracted broad five factors. These five factors were labeled as extraversion or surgency (talkative, assertive, energetic); agreeableness (good-natured, cooperative, trustworthy); conscientiousness (orderly, responsible, dependable); emotional stability vs neuroticism (calm, not neurotic, not easily upset); and intellect or openness (intellectual, imaginative, independent-minded) (Pervin & John, 2006). Goldberg (1981) assumed that these factors are “Big Five” not only due to their intrinsic greatness but also due to their extreme broadness. It means that “Big Five” factors not only explain five traits but also they include five broad personality characteristics as well as different facets of each factor.

Several studies have been conducted during 1970s and early 1980s for the existence and replicability of these five factors (Botwin & Buss, 1989; Conley, 1985; De Radd et al., 1988; Digman & Inouye, 1986; Field & Millsap, 1991; Goldberg, 1981, 1990; John, 1990; McCrae & Costa, 1985c, 1987; Peabody & Goldberg, 1989; Saucier & Goldberg, 1996a). All the studies in this regard were based on Cattell’s selected variables i.e. condensed personality sphere (Block, 1995). Furthermore, Norman (1967) described the personality descriptors into 75 semantic categories to update the Allport and Odbert’s list and to rectify the imperfections of Cattell’s reduction steps. Goldberg (1981, 1982, 1990) also investigated the stability and generalizability of these broad factors in the context of methodological variations and data sources. For this, he constructed an inventory of 1,710 trait adjectives using the list of 75 semantic categories, and factor analyzed their intercorrelations in the self-rating data. Different methods of extraction and rotation provided the broad five factors which resembled with the present Big Five. For more clarification, Goldberg (1990) conducted two additional studies using abbreviated sets of more common terms. In the first study, he obtained self and peer ratings of 475 very common trait adjectives grouping into 131 sets of “right synonym” clusters. Five factors were
extracted and a convergence between self and peer ratings was found. In the second study, 435 highly familiar trait adjectives were selected and rated by subjects and the obtained factor structure consisting of five factors was closely related with Big Five (Saucier & Goldberg, 1996a).

Goldberg (1990, 1992) also reduced his extensive taxonomy of adjective lists in a more systematic way and with which a 50-item instrument based on “transparent format” has been developed. Every factor included the 10 bipolar adjective scales (e.g. quit-talkative) which were grouped together under the factor name. Goldberg (1992) used a set of 100 unipolar trait descriptive adjectives (TDA) and refined these adjectives for an optimal representation of the five factors. Using adjectives scales, Wiggins (1995) also developed a measure of Big Five in his 20 year program of research in the interpersonal circumflex which composed of both the conception and measurement of the two major dimensions of interpersonal behavior i.e. dominance (agency) and nurturance (communion). Both the dimensions have been found closely related with extraversion and agreeableness respectively. Later on, he added some more adjectives to make compatible with all the dimensions of Big Five and developed the new version of earlier instrument, called ‘Interpersonal Adjective Scale’ (Wiggins, 1995) having excellent psychometric properties.

Besides the samples, raters and methodological variations, the replicability of Big Five has also been explored in the context of cross language and cross cultural settings adopting criterion for evaluation of personality taxonomy (John et al., 1984). Goldberg (1981) argued that these researches are important to assess the individual differences across the languages and cultures. Now it is assumed that some personality dimensions are universal and some are culture-specific due to human survival values and particular social context respectively. The language replicability of factors is very and expansive, so until 1990s, few efforts have been made because the initial classifications of personality were only in English as most of taxonomers were Americans (John et al., 1984; John et al., 1988). In the beginning, most of the studies in this regard were conducted in two languages i.e. Dutch and German being closely related to English. The Dutch project has been taken by Hofstee and their colleagues at the university of Groningen in the Netherland (De Raad et al., 1988; Hofstee et al., 1997); and obtained five factor structure was similar to English Big
Five. On the other hand, the German project carried out by Angleitner and colleagues (1990) in Bielefeld based on German personality vocabulary also confirmed the existence of five factors. It provided a blueprint for several taxonomic efforts in other languages (Angleitner et al., 1990). Replicability across languages, it requires translation but sometime it reduces the originality of items. For example, one wonders why “temperamental” was a definer of extraversion in German until one realizes that the German trait was probably temperamentvoll which has nothing to do with temper but means “full of life and energy” as in vivacious (Pervin & John, 2006). Although, it is most probably happening in monolingual investigations. On the other hand, bilingual studies reported the cross language generalizability because in this situation, sample differences can be fully controlled and translation checks at the level of individual items because the same subjects provide descriptions in both languages (John et al., 1984; Benet-Martinez & John, 1998). In this regard, John and his colleagues (1984) investigated translation equivalence between English and German trait adjectives, with a mean correlation of .52 across a two-week interval between administrations, following the back translation procedure.

Generalizability of Big Five has also been reported in other languages, such as Chinese (Yang & Bond, 1990), Czech (Hrebickova & Ostendorf, 1995), Hebrew (Almagor et al., 1995), Hungarian (Szirmai & De Raad, 1994), Italian (De Raad, Diblas & Perugini, 1998), Polish (Szarota, 1995), Russian (Shmelyov & Pokhilko, 1993), and Turkish (Somer & Goldberg, 1999). Although five factors have been found to be generalized but it has also been suggested that more than five factors are needed to be rotated and sometimes two indigenous factors corresponded to one of the Big Five. Review of literature pertaining to cross language replicability reveals substantial empirical support for the psychometric criterion for five factors.

Taxonomy of Big Five factors has been studied mainly with two research approaches i.e. adjective based and questionnaire based. So, questionnaire based studies also support the Big Five, even in better taxonomic and theoretical system than lexical based. Pervin and John (2006) observed that joint factor analysis of questionnaires developed by different investigators had shown that two broad dimensions-extraversion and neuroticism, appear in one form or another in most personality inventories. In early 1980s, Costa and McCrae developed the NEO
Personality Inventory (published in 1985) to measure three broad dimensions of personality i.e. neuroticism, extraversion, and openness to experience. For the development of NEO-PI main work started with cluster analysis of 16PF (Cattell, Eber, & Tatsuoka, 1970); also worked on openness to experience, which emerged from several of Cattell’s primary factors (e.g. imaginative, experimenting) (Costa & McCrae, 1976). These three broad factors were found closely related with three of the Big Five factors. After that, they extended their model with agreeableness and conscientiousness, and in several studies found the clear convergence with adjective based measures of Big Five, even openness to experience emerged broader factor than intellect or imagination (McCrae & Costa, 1985b, 1985c, 1987; Saucier & Goldberg, 1996a). These five factors were also observed in various other personality questionnaires as well as in self-ratings on Block’s (1961, 1968) California Adult Q-set (Costa & McCrae, 1992; McCrae & Costa, 1990).

Furthermore in 1985, Costa and McCrae developed a prominent NEO-Personality Inventory based on five broad dimensions of which neuroticism, extraversion, and openness to experience were with six facets per factor; and agreeableness and conscientiousness were without facets. But in 1992, they further revised the inventory which included six facets for each factor. Several studies have shown the good psychometric properties (internal consistency, temporal stability, convergent and discriminant validity against spouse and peer ratings) of NEO-PI-R along with languages and cultural generalizability (Costa & McCrae, 1992; McCrae & Costa, 1990, 1997). They also developed the short version of NEO-PI-R that is NEO-FFI which includes 60 items based on similar five factors and their six facets per factor (Costa & McCrae, 1992). NEO-FFI consists of items having highest loadings in NEO-PIR. These five broad factors are described as: Extraversion vs Introversion (gregariousness, assertiveness, activity, excitement-seeking, positive emotions, warmth); Agreeableness vs Antagonism (trust, straightforwardness, altruism, compliance, modesty, tender-mindedness); Conscientiousness vs Lack of Direction (competence, order, dutifulness, achievement striving self-discipline, deliberation); Neuroticism vs Emotional Stability (anxiety, angry hostility, depression, self-consciousness, impulsiveness, vulnerability); and Openness vs Closeness to Experience (ideas, fantasy, aesthetics, actions, feelings, values).
Five Factor model of personality (based on adjectives or questionnaires) is hierarchical which includes the five broad factors at the highest level. Besides these five factors, it has been observed that these are not independent but co-varied and are organized into two very broad factors which are called Alpha (or socialization) and Beta (or personal growth) factors (Digman, 1997). Alpha factor has significant negative loadings of neuroticism, and positive of agreeableness and conscientiousness, whereas Beta factor is composed of positive association of extraversion and openness to experience. Markin and his associates (2005) asserted that if factor scores of NEO-PI-R are analyzed then Alpha and Beta factors can be extracted. Neurobiological model proposed for Beta factor and it’s plasticity (De Young et al., 2002) contends that both Alpha and Beta superfactors are heritable (Jang et al., 2006). There are two reasons for association among the five factors; one is shared casual structures, for example, a set of genes or a neurological structure may have effects on both extraversion and openness to experience traits in general; and second, the associations reflect the particular choice of facets to define each other, for example, the NEO-PI-R neuroticism domain includes N5: impulsiveness which reflects an inability to control impulses, and which is not surprisingly also related to low conscientiousness (De Young et al., 2002; Jang et al., 2006).

Regarding the convergence of Five Factor Model with other models, several studies have revealed substantial relationship. Two broad factors (extraversion and neuroticism) seem to be universally accepted because they have been included in all the major contemporary models of broad personality traits, and convergence for remaining three broad factors (openness to experience, agreeableness, and conscientiousness) is still somewhat controversial (Boyle, 2008). Even, some personality psychologists developed their own dimensions attacking the adequacy of Five Factor Model. It has been argued that agreeableness and conscientiousness are primary facets/traits of psychoticism dimension of Eysenck’s PEN model (Eysenck, 1992a). In the recent era of personality psychology, several models and associated measures have emerged which depict some contradictory association with Five Factor Model. It is also reported that 30 facet scales included in NEO-PI-R appear to vary in levels of heritability (Jang et al., 2002) highlighting the importance of primary factors (or facet dimensions) in addition to second-stratum dimensions.
Furthermore, Five Factor Model helps not only in understanding of personality traits, but it also provides a systematic research on a variety of topics. First of all, if there is substantial agreement across different raters then it will present the common characteristics about the target topic. Five Factor Model is widely accepted and frequently used in the area of personality researches, well-being and mental health, clinical practice, abnormal personality structure, personnel selection, and many of the other areas (Boyle, 2008). For example, important outcomes of neuroticism are related with well-being and mental health; high neurotic persons tend to be unhappy, regardless of their life situation, and they are more susceptible than others to psychiatric disorders such as depression and many of the personality disorders (Bagby et al., 1997; Trull & McCrae, 2002). It is reported that extraversion is related with popularity and social success, with enterprising self-promotion, and ultimately with higher lifetime income (Soldz & Vaillant, 1999). McCrae (1996) found that openness is a predictor of creative achievement whereas closeness predicts political conservatism and religious fundamentalism. Agreeableness is the best predictor of better marital relations (Donnellan et al., 2004) whereas antagonistic is of committing crimes and abuse drugs (Brooner et al., 2002). Conscientiousness is associated with job performance, productivity of employees, positive health habits (safe driving, exercise, sensible diet), and long life (Barrick & Mount, 1991; Weiss & Costa, 2005). Moreover, the Neo-PI-R includes the norms, profile sheets, and computer administration and interpretation; hence, widely adopted by clinical psychologists and psychiatrists for a standard routine clinical assessment (Archer & Smith, in press; Weiner & Greene, 2008). It is helpful in making the rapport with client (such as resistance and poor motivation to change), selection of optimal forms of treatment, and in prediction of treatment outcomes (Boyle, 2008). Several studies have been conducted with NEO-PI-R in relation to abnormal behavior which have provided significant relations such as paranoid persons would be high on N2: angry hostility and low on A1: trust, A2: straightforwardness, and A4: compliance.

In the personality psychology, the issue of personality development has been concern of research consistently. Similarly, Five Factor Model has also been focused on the exploration of antecedents of adult personality traits, how traits develop, the timelines for the convergence and peak expression of traits, their stability or change
throughout the lifespan, and the effects of traits on other aspects of personal
development (Pervin & John, 2006). It has been observed, in general, that five factor
model is not capable to explain the development in childhood and adolescence
(Pervin, 1994). However, in several developmental and temperamental researches a
number of traits (e.g., sociability, fearful distress, shyness, impulsivity) have been
found stable across the age levels but these studies were based on only one trait at
single time which is not appropriate description of developmental issue. Regarding
the developmental issue, firstly it is reported that five factors of Five Factor Model
emerge as basic dimensions of personality in adulthood; secondly Five Factor Model
has proven useful as a framework for organizing findings on adult personality in areas
as diverse as behavioral genetics and industrial psychology. Thus, it is necessary to
explore the antecedents of the five factors of Five Factor Model and their relations to
other aspects of personality functioning in childhood and adolescence.

Zuckerman’s Alternative Five Factor Model:

Nearly all personality psychologists have been interested in understanding the
nature and causes of individual differences in response patterns across time and space;
and in using this knowledge to make predictions regarding future behavior (Joireman
& Kuhlman, 2004). For the realization of these goals, every personality psychologist
has tried to develop a theory and its measurement. In the history of personality
psychology, developing a theory and its measurement are closely equivalent to define
a trait such as sensation seeking, impulsivity, hostility at narrow level; or to define a
dimension or factor such as introversion-extroversion, neuroticism-emotionally stable,
psychoticism-impulse control at broader level. Marvin Zuckerman also became
interested in understanding the personality at narrow as well as broader level like
other personality psychologists such as Gordon Allport, R. B. Cattell, H. J. Eysenck,
L. R. Goldberg, R. R. McCrae and P. T. Costa. Another model of personality has been
(AFFM) which is similar to Five Factor Model but not identical. These five
alternative factors can be described in terms of Neuroticism-Anxiety, Aggression-
Hostility, Impulsive-Sensation Seeking, Sociability, and Activity.

Every theory or model of personality is based on some assumptions which
may be implicit or explicit that must be responsible for development and
interpretation. These assumptions provide the empirical taxonomy and ability to predict individual’s behavior (Joireman & Kuhlman, 2004). Zuckerman also assumed that before identifying and measuring the basic dimensions of personality, it is necessary to define the fundamental question: what is a basic dimension of personality? The answer of this question must differentiate the Alternative FFM from other models of personality. Zuckerman (1991, 1992) argued that the basic dimensions of personality must fulfill the four criteria: first, it should be reliably identified across different methods, genders, ages, and cultures; second, it should be moderately related with heritability; third, it should be identified in non-human species also, especially in socially organized species; and finally, it should be explained in terms of biological tendencies. It is observed that most popular FFM is capable to provide the evidence about only first two criteria, and less agrees on the remaining two criteria. Regarding the third criteria, it is argued that several dimensions of the FFM do not easily translate into behavioral patterns that are observed in non-human species. For example, agreeableness and conscientiousness are more difficult to identify in non-human species than impulsivity and aggression. Lastly, FFM does not have sufficient evidence about biological markers associated with personality dimensions. So, there is partial agreement and partial conflict between FFM and Alternative FFM (Joireman & Kuhlman, 2004).

In the late 1980s, Zuckerman and Kuhlman started work on the initial development of Alternative FFM following the four basic criteria of personality dimensions. For this, they selected those scales which were already being used as measures of temperament, e.g. Buss and Plomin’s (1975) measures of emotionality, activity, sociability and impulsiveness. They also selected those scales which were associated with high heritability or biochemical/psychobiological measures such as three superfactors (extraversion, neuroticism, psychoticism) from EPQ (Eysenck, 1985), and sensation seeking scales (Zuckerman, 1979). They assumed that there should be nine basic dimensions such as sociability, general emotionality, anxiety, hostility, socialization, sensation seeking, impulsivity, activity, and social desirability (Joireman & Kuhlman, 2004). Furthermore, they selected a total of 46 scales, of which at least three scales were associated with each of the nine hypothesized factors; and administered on 271 students (178 females and 73 males) (Zuckerman et al.,
Rotations were carried out for three separate factor analyses that varied from three to five to seven factors. To assess the cross-gender similarity, male and female factor loadings were correlated which revealed very good agreement on the factor solutions at the three factor level, good agreement on four of the five factors at the five factor level, and good agreement on six of the seven factors at the seven-factor solution.

Moreover, three factor solution was equivalent with three superfactors of Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975) i.e. extraversion, neuroticism, and psychoticism. First factor was composed of significant loadings of extraversion of EPQ, and other measuring scales of sociability and activity; second factor composed of significant loadings of scales of neuroticism (EPQ), anger, hostility, general emotionality, lack of emotional control and work efficiency; and on the third factor, significant loading of the scales of psychoticism (EPQ), independence, sensation seeking, impulsiveness, socialization, planning, responsibility, restraint, and social desirability. Regarding the association between three and five factor solutions, correlations of factor scores computed for each model and the first factor (extraversion-sociability) divided into two factors i.e. sociability and activity; second factor (neuroticism-emotionality) remained same; third factor (psychoticism-impulsive unsocialized sensation seeking) was divided into impulsive sensation seeking and aggressive sensation seeking. For the seven factor solution, neuroticism-emotionality was categorized into two factors i.e. anger and anxiety. Zuckerman (1991) argued that anxiety and aggression; and sociability and general activity are separate factors which are combined in neuroticism and extraversion of EPQ respectively.

In the next study, Zuckerman and his associates (1991) selected 33 scales which were the best markers for each of the seven factors in previous study, and administered on a large sample (N=525) to verify the stability of the factors across genders. Rotations were carried out for three and five factor solutions because four factor solution was not successful and in six factor solution only one factor (impulsiveness) was found for males but not for females. In case of three and five factor solutions, Tucker’s congruency coefficients were reported from 0.95 to 0.96 for
corresponding factors and close to zero for diverging factors (Joireman & Kuhlman, 2004). Furthermore, they also used simultaneous component analysis (Kiers & Berge, 1989) to assess the gender similarity for three and five factor solutions. Results clearly revealed that the factor structures for men and women shared a very high degree of overlap implying that three or five factor solutions are quite robust for males and females. However, Zuckerman et al. (1991) assumed that due to hierarchical nature, three and five factor solutions both are valid. Thus, extraversion-sociability, neuroticism-emotionality, and psychoticism-impulsive unsocialized sensation seeking can be extracted for three factor solution, and neuroticism-anxiety, activity, aggression-hostility, impulsive-sensation seeking, and sociability can be extracted for five factor solution.

For the measurement of AFFM Zuckerman et al. (1993) developed the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ). For the development of this scale, the items came from the test scales used in exception of those from the Eysenck Personality Questionnaire (EPQ). The separate items were correlated first with the factors derived from the total scales scores: Neuroticism-Anxiety, Aggression-Hostility, Impulsive-Sensation Seeking, Sociability, and Activity. Twenty items for each factor scale were selected on the basis of high correlations with the designated factor, low correlations with the other factors, and low correlations with the scale for social desirability. These 100 items were factor analyzed. Eighty nine of the 100 items loaded highly and significantly on the factors to which they had been assigned on the basis of item total correlations. Ten new items were added to comprise a validity scale on the basis of infrequency and social desirability. This is not a reliability scale and is used to eliminate individual’s test records of dubious validity. The final form of the ZKPQ consists of the 99 true-false items.

Factor analysis of items within the major five scales was done in order to identify possible sub-factors. Scree plots indicated that one factor was sufficient to describe both the Neuroticism-Anxiety and Aggression-Hostility scales. Two factor solutions contained one sub-factor for liking lively parties and having a lot of friends (PF) and another for an intolerance of social isolation (II). The Impulsive-Sensation Seeking has been divided into Impulsivity and Sensation Seeking. The Activity factor
has been divided into a need for general activity (GA) and a specific need for work activity (WA).

The Zuckerman-Kuhlman Personality Questionnaire (ZKPQ; Zuckerman & Kuhlman, 1993) consists of 5 Content Scales plus an Infrequency Scale that allows eliminating subjects with careless responding. The ZKPQ includes total 99 dichotomous items (in sentence format and true-false response set). The five scales can be described in terms of their typical contents:

1. **Activity** (17 items) items describe the need for general activity, an inability to relax and to do nothing when the opportunity arises, and a preference for hard and challenging work, an active busy life and high energy level. Two facet scores can be obtained from this scale need for general activity, impatients and restlessness (9 items) and need for work activity (8 items).

2. **Neuroticism-Anxiety** (19 items) items describe frequent emotional upset, tension, worry, fearfulness, obsessive indecision, lack of self-confidence and sensitivity to criticism.

3. **Impulsive-Sensation Seeking** (19 items) items involve a lack of planning and the tendency to act impulsively without thinking and the seeking of excitement, novel experiences, and willingness to take risks for these types or experiences. These items are general in content and do not describe specific activities such as risky sports, drinking, drugs, or having sex. These items were eliminated to avoid confounding studies of persons who actually engage in one or another of these activities. Two facet scores can be obtained from this scale: Impulsivity (8 items) and Sensation Seeking (11 items).

4. **Sociability** (17 items) items describe the number of friends one has and the amount of time spent with them, outgoingness at parties and a preference for being alone and engaging in solitary activities. Two facet scores can also be obtained: Parties and friends (9 items) and isolation intolerance (8 items).

5. **Aggression-Hostility** (17 items) items describe a readiness to express verbal aggression, rude thoughtless or antisocial behavior, vengefulness and spitidedness, having a quick temper and impatience with others.

The ZKPQ also includes an **Infrequency Scale** (10 items). It should only be used to detect inattention to the task or simply a validity measure for the individual
test taker. The items are mostly exaggerated, true scored, socially desirable but unlikely to be completely true statements about anyone. This scale is highly skewed with most scores around 0 or 1.

Regarding the psychometric properties of ZKPQ, numerous studies have been conducted which report that it has high retest and internal reliabilities for males and females (Zuckerman, 2002, 1993). Regarding gender differences, men have been found scoring higher than women on impulsive-sensation seeking, aggression-hostility, and activity whereas women scoring higher than men on neuroticism-anxiety. Extracted factor structure from all the scales of ZKPQ, EPQ, and NEO-PI-R depict the convergent validity. Four factors were found that accounted for 74% of the variance and the fifth factor was less than one and there was a negligible increase in variance explained by the five factor solution (Zuckerman et al., 1993). For Discriminant Validity, all scales of ZKPQ loaded at least twice as high on one factor than on the other three. However, the single exception was for impulsive-sensation seeking for which the highest loading was 0.74 and the second highest was 0.48. Moreover, some other studies also investigated the Convergent Validity of all the five scales of ZKPQ in relation to measures of temperament, sensation seeking, ego control and resiliency, reward and punishment expectancies, public and private self-consciousness, social anxiety, subjective well-being, internet addiction, and quality of life (Joireman et al., 2003; Zuckerman et al., 1999; Kumar & Singh, 2013, 2014; Kumar, 2015). Regarding the cross-cultural language replicability, a number of studies the satisfactory report in different languages i.e. Chinese (Wu et al., 2000), Catalanian (Goma-i-Freixanet et al., 2008), German (Ostendorf & Angleitner, 1994), Japanese (Shiomi et al., 1995, 1996), Spanish (Aluja et al., 2002, 2003; Gutierrez-Zotes et al., 2001; Herrero et al. 2001; Penate et al. 1999; Romero et al., 2002), and Hindi (Kumar & Singh, in press).

Some researchers have studied relationship of Alternative FFM with FFM and PEN model. The findings of joint factor analysis of ZKPQ and NEO-FFI scales suggest a large degree of convergence of both models (Costa & McCrae, 1992b; Zuckerman et al., 1993). It is reported that two factors are highly correlated, i.e. neuroticism-anxiety of AFFM with neuroticism of FFM; sociability of AFFM and extraversion of FFM. Similarly, there were some convergence between impulsive-
sensation seeking and conscientiousness, and between aggression-hostility and agreeableness. Zuckerman (1993) argued that the factor activity not emerge as separate factor during the joint factor analysis of ZKPQ, NEO, and EPQ scales. Confirmatory Factor Analysis suggested the clear convergence between three broad dimensions of EPQ and five of ZKPQ.

Besides the relationship with NEO and EPQ scales, ZKPQ has also been used in relation to some other behavioral measures such as Love Attitude Scale (Hendrik & Hendrik, 1986). Correlations between dimensions of ZKPQ and love styles suggested that impulsivity was correlated negatively with pragma, and positively with agape; sensation seeking correlated positively with ludus, and negatively with pragma; impulsive-sensation seeking correlated positively with ludus and agape, and negatively with pragma; sociability correlated positively with eros and negatively with ludus; neuroticism-anxiety correlated negatively with eros and storge, and positively with mania; aggression-hostility correlated positively with mania and negatively with agape; and activity correlated positively with ludus, pragma, and mania (Schmitz, 2004).

Rational of the Study:

Forgoing theoretical discussion reveals that field of personality addresses three issues: (1) human universals, (2) individual differences, and (3) individual uniqueness, of which first relates with what are universal features of human nature? Second deals with how do people differ from one another, and the third relates to the uniqueness of an individual and how it can be explained in scientific manner. These three issues have been addressed in terms of various perspectives i.e. psychodynamic, humanistic, learning, cognitive, and trait. Among these trait approach has contributed most in understanding the various aspects of personality. The personality psychologists are basically oriented (1) to observe people scientifically and to develop theories that are (2) systematic, (3) testable, (4) and comprehensive; and to convert the data based theory into practical applications. To address the above mentioned issues and to provide comprehensive explanation of personality, the personality psychologists have researched various aspects of personality: (1) personality structure-----the basic units in building blocks of personality, (2) process-----the dynamic aspects of personality including motives, (3) growth and development----

36
how one develops into an unique person; and (4) psychopathology and behaviour change how people change and why they sometimes resist change or are unable to change.

The trait approach has contributed the most in scientific understanding of various aspects of personality. The study of personality traits has advanced towards “normal science” in the sense that most of the researchers share set of common core beliefs supported by empirical evidence including the relative stability of traits overtime, a significant genetic and biological influence on personality, and relevance of traits to many areas of everyday life (Boyle et al., 2008). Each one of these beliefs has been contested in the past, but evidence in favour of each one is overwhelming (Boyle et al., 2008; Mathewes et al., 2003). The roles of gene-environment interaction in personality development and of person-situation interaction in determining behaviour are well established. Overall, trait models have also stimulated important and unresolved debates including the optimal measurement framework for traits the mechanisms that transmit causal effects of traits on behaviour, as well as the roles of cultural and social factors in moderating the nature of traits. In addition, trait theory is only one scientific paradigm for personality research.

The basic tenets of modern trait theory, in their contemporary form, are very clear and well established, they owe much to three founding fathers of trait psychology: Gordon Allport, R. B. Cattell, and Hans. J. Eysenck. Enrichment of trait approach has been further contributed by so many scholars notably McCrae and Costa, and Zuckerman. At the outset, Allport (1937) embarked, “In everyday life, no-one, not even a psychologist, doubts that underlying the conduct of a mature person there are characteristic dispositions or traits.” Allport defined a trait or disposition as “a generalized neuropsychic structure peculiar to the individual, with the capacity to render many stimuli functionally equivalent and to initiate and guide consistent forms of adaptive and stylistic behaviour.” Allport took idiographic stance on traits whereas rest of trait theorists took nomothetic stance that seeks to quantify traits that are meaningful for all individuals.

Nomothetic approach to traits much owes to R. B. Cattell (e.g. Cattell, 1973; Cattell & Kline, 1977) who articulated that main attributes of personality may be
described by a number of discrete dimensions. Cattell’s theory strongly linked to quantitative measurement models based on factor analysis of three sources of data-----L-data, Q-data, and T-data. Cattell’s conceptualization of personality is based on four attributes. First, the trait as a latent construct with causal force, the source trait; distinguished from superficial regulations in behaviour or surface traits. Second, personality models should be hierarchical. Third, the personality sphere should be differentiated from other domains of individual differences, including ability, sentiments, and transit mood states. Fourth, the influence of traits on behaviour is moderated by situational factors. These four characteristics of Cattellian theory as mentioned above have been key principles for most contemporary trait theories.

Another founding trait theorist is Eysenck (Eysenck, 1957, 1967) who debated with Cattell on optimal number of factors. Eysenck mainly focused on three broad dimensions: extraversion, neuroticism and psychoticism, as compared to Cattell’s 16 primary factors and several secondary factors (Boyle, 2006). This debate appears to be more apparent than real, since both have focused on measurement at different levels within the hierarchical trait model. There is communally between Cattellian second-order factors and Eysenckian three broad dimensions, so Cattell’s and Eysenckian constructs and theories need to be seen, not as mutually contradictory, but as complementary and mutually supportive (Eysenck, 1984). Eysenck attempted to ground traits in heritable properties of brain. In addition, Eysenck made use of empirical studies to test the relationship between traits and behaviour-----and the moderating role of situational factors in controlled experiments. Central to Eysenck’s program was empirical investigation what these days are called consequential outcomes (Ozer & Benet-Martinez, 2006), the real-life outcomes in relation to mental health, academic and work accomplishments and social relationships.

Five Factor model is the default model of personality structure, guiding not only personality psychologists, but increasingly, developmentalists (Kohnstamm et al., 1998), cross-cultural psychologists (McCrae & Allik, 2002), organizational psychologists (Judge et al., 1999), and clinicians (Singer, 2005). It has become the most widely accepted solution to the problem of describing trait structure, and relations among the traits. Trait adjectives describe individual differences that usually show a bell-shaped distribution. It was Cattell’s early pioneering work that served as
the starting point for subsequent lexically based development of the present popular five factor model of personality structure which indexes 30 facets and five dimensions labeled as Neuroticism (N), Extroversion (E), Openness to experience-intellect (O), Agreeableness (A), and Conscientiousness (C). The FFM dimensions have been derived from various factor analytic studies of self-report and peer reports of adjectives and questionnaire personality-related data (Costa & McCrae, 1992). Costa and McCrae have developed a Neo-Personality Inventory and NEO-FFI for indexing the five broad dimensions of personality. The present study has also used NEO-FFI to index the five broad traits of FFM among Indian subjects.

Zuckerman (1988, 1991, 1993) developed an alternative five factor model (AFFM) which appears to be similar to FFM but not identical. Five factors described in AFFM are Neuroticism-Anxiety, Aggression-Hostility, Impulsive-Sensation Seeking, Activity, and Sociability. Zuckerman in collaboration with Kuhlman has developed ZKPQ for the measurement of alternative factors (Zuckerman et al., 1993) which consists of 5 content scales plus an Infrequency Scale. It consists 99 items for these scales.

Majority of trait researchers have subscribed a set of basic assumptions for the development of their trait models (Mathews et al., 2003; Pervin, 2002; Boyle et al., 2008). The first assumption is that traits are relative stable, continuous, dimensional qualities that require psychometric basis meeting the standard criteria for reliability and validity. The present study also intends to examine the existence of alternative five factors among Indian subjects, and to ascertain the reliability and validity of ZKPQ scales for these five dimensions.

Second assumption or principle pertains to the genetic basis for traits that requires support from behaviour genetic and molecular genetic evidence. It is not taken up in the present study.

Third principle is about the generality of expression of traits depicting that traits correspond to individual differences evident in all environments, cultures, and psychosocial factors including real-life contexts i.e. health, work and relationship (Boyle et al., 2008). The present study also intends to ascertain the generality of alternative five traits of AFFM among the Indian contexts.

The fourth principle is interactionism (Endler, 1983) depicting that it is
necessary to accommodate the role of situations in moderating the trait’s expressions, personality development, and matching of traits against jobs, therapies, teaching styles etc. The present study is not sticking to this principle.

Since the AFFM is the recent one among the trait models, so it is necessary to ascertain the generality of its factors across the cultures. Cross-cultural replicability is an important criterion of validity for personality models like FFM and AFFM that claim personality is biologically rooted and should be universal (Rossier et al., 2005, 2007). This equivalence may be studied at a structural level or at a metric or scalar level. Over the past decades, a good number of cross-cultural studies have been conducted and confirmed the high structural equivalence of FFM (Allik, 2005; McCrae et al, 2005; Rolland, 2002). The studies for the cross-cultural equivalence of AFFM are less in number. However, several translations of ZKPQ are available. Goma-i- Freixnet et al. (2004) made the first study in this regard by comparing the structure obtained in Italian sample with the normative American structure. For women, the congruence coefficients for all the factors were above the factorial replication threshold of .85 (Haven & Ten Berge, 1997). For men, congruence coefficients of two factors i.e. Impulsive-Sensation Seeking and Aggression-Hostility were equal to or below this threshold. Recently, Rossier et al. (2007) studied the cross-cultural generalizability of AFFM on a sample of 9152 subjects from six countries i.e. China, Germany, Italy, Spain, Switzerland and USA. Internal consistencies for all countries have been found generally similar to those found in normative American structure and replicated in all cultures; however, the congruence coefficients were slightly lower in China and Italy. A similar analysis at the facet level confirmed the high cross-cultural replicability of AFFM. The mean score differences across countries were very small depicting the universality of five dimensions of AFFM. The present study also intends to ascertain the emergence of five factors of AFFM among Indian subjects.

It has also been observed that a number of studies have been conducted to explore the convergence of AFFM with FFM and PEN model. More recently, Aluja et al., (2002) compared AFFM with FFM using ZKPQ and NEO-PI-R (Costa & McCrae, 1992). Considering only correlations above .40, they found that Impulsive-
Sensation Seeking correlated negatively with Conscientiousness \((r=-.53)\), Neuroticism-Anxiety correlated positively with Neuroticism \((r=.81)\), Aggression-Hostility correlated negatively with Agreeableness \((r=-.59)\) and Sociability correlated positively with Extraversion \((r=.66)\). Similar findings have also been reported by several researchers (Blanch & Aluja, 2011; Kumar, 2011). Thus, four dimensions of the AFFM and of the FFM appear quite similar, and the differences between these two models is the presence of a single dimension in each model that has no conceptual equivalent counterpart (Joireman & Kuhlman, 2004; Zuckerman et al, 1993). Indeed, Openness to experience of NEO-PI-R is represented poorly in ZKPQ and Activity of ZKPQ represented poorly in NEO-PI-R. Angleitner et al. (2004) studied a sample of 338 pairs of adult twins reared together and found that heritability of factors indexed by ZKPQ ranged from .43 to .51. These results are similar to those found for FFM (McCrae, et al., 2001). In relation to PEN model, studies reveal that Psychoticism correlated positively with Impulsive-Sensation Seeking and Aggression-Hostility; Neuroticism correlated positively with Neuroticism-Anxiety, Aggression-Hostility and Work Activity; and Extraversion correlated positively with Sensation Seeking, Sociability and Activity (Zuckerman et al., 1993). The present study also intends to examine the convergence/compatibility of AFFM with Cattellian, Eysenckian, and Five Factor models of personality.

Throughout the history of overlapping trait models of personality, hierarchical organization of traits has been one of the important issues (Raad, 2009). Cattell, Eysenck and others have proposed the hierarchical organization of personality in their models. Some researchers have also been conducted to ascertain the hierarchical organization of facets/traits in FFM and AFFM. The present study also intends to examine the hierarchical and organization of personality dimensions of AFFM in data from Indian subjects. Review of literature related to AFFM clearly reveals that none of the systematic study has been conducted for the verification and cross-cultural replication of five factors of AFFM and its convergence with other trait models of personality in Indian perspective. Hence, the present study has been designed to verify the existence of five factors of AFFM, cross-cultural replicability of alternative five factors; and convergence of AFFM with Cattellian, Eysenckian, and FFM models of personality in data from Indian subjects.
Problem: The precise title of the problem is stated as:

VERIFICATION OF ZUCKERMAN'S ALTERNATIVE FIVE FACTOR MODEL OF PERSONALITY ON INDIAN SAMPLE

Objectives:
Main objectives of the study are:
1. Verification of five factors of Alternative Five Factor Model in Indian language context.
2. Examination of hierarchical organization of five factors of Alternative Five Factor Model.
3. Investigation of convergence/compatibility of AFFM with Cattellian model of personality.
4. Investigation of convergence/compatibility of AFFM with Eysenckian model of personality.
5. Investigation of convergence/compatibility of AFFM with Five Factor model of personality.
6. Cross-cultural comparison of present findings with those of conducted in other cultural settings.
7. Examination of gender differences in five factors of AFFM among Indian subjects, if any.

Hypotheses:
Specific hypotheses are as under:
1. Alternative Five factors of AFFM are expected to be verified as such in data from Indian subjects.
2. Two super factors of AFFM are expected to be verified in data from Indian subjects.
3. Cattellian model and AFFM are expected to have some overlap with each other.
4. Eysenckian three dimensions are expected to be inclusive of AFFM’s five factors.
5. FFM and AFFM are expected to have some overlap with each other.
6. Findings of present study are expected to be comparable to those of other cultural settings.
7. Male and Female subjects are expected to differ on five factors of AFFM.