CHAPTER II
THEORETICAL ORIENTATION

CONCEPT OF ANXIETY

The concept of anxiety was not even mentioned in the indices of psychological literature published before the late 1930s (Eysenck, 1975), except in the works of psycho-analytic writers. Moreover, remarked ".....there is at present no experimental psychology of anxiety, and one may even doubt whether there will ever be," (Cf. May, 1950, P.99). This prophecy proved false so far as the appearance of anxiety in literature is concerned. Theoretical statements have largely been followed by extensive researches and now literature on anxiety is so vast that it is practically not possible to present various viewpoints expressed by various psychologists, clinical psychologists and investigators. It continues to prove an area of wide interest and want for researchers in present times.

Systematic study of anxiety started with Freud's (1936) conceptualization of it as a signal of danger and later as constituting three main attributes: a specific unpleasurable quality; efferent or discharge phenomena; and perception of these. Anxiety remained a psychoanalytic concept for a long time. Freud, first of all introduced and popularized this term in Psychology and distinguished between fundamental emotions of fear and anxiety by describing them as objective and subjective respectively.

Freud stressed the signaling properties of anxiety and earlier Pavlov (1927) also considered apprehension of danger as
an important characteristic of anxiety (Cf. Spielberger, 1972, p. 5). Basic features of psycho-analytic origin of anxiety are traced back to birth trauma, when the child experiences sudden helplessness and insecurity induced by an under-developed nervous system which is still inadequate to cope with many situations and problems imposed upon it. This traumatic state is a prototype of all later anxiety reactions and is universally experienced.

Later, neo-freudians, Karen Horney (1937), Goldstein (1939), May (1950), Rogers (1951), Sullivan (1953), Fromm-Reichmann (1955), Basowaitz, Persky, Korchin, and Grinker (1955), presented views, more or less, consistent with Freud's formulations of anxiety as an emotional state and a reaction to environmental conditions perceived by the child, as threatening to his development and integrity. Anxiety is distinguishable from other emotions by its unique combination of phenomenological and physiological components. Phenomenological components are the feelings of apprehension, tension and dread, and physiological discharge phenomena are essential aspects of anxiety states.

Following Freud, neo-freudians emphasized the apprehensive or signaling properties of anxiety and contended that its origin lies deep rooted, i.e., related to earliest unpleasant experiences of childhood, is internally derived, provoked by threat to the integrity of an individual, is accompanied by feelings of fear of isolation, insecurity, helplessness, and perception of the outside world as hostile.
Literature at the verbal and nonoperational level over four decades beginning mainly with Freud's distinction between fear and anxiety has produced hundreds of different interpretations and definitions of anxiety. However, out of the numerous viewpoints and researches conducted within the context of anxiety, two principal approaches have emerged on the contemporary scene, that of Freudian or Psycho-analytic, and Hullian or Drive theory approach.

A recent theory based on psycho-analytic approach, enunciated by Sarason and colleagues, advanced the view that anxiety is largely determined by the nature of a situation and interacts with personal characteristics of the individual. Exponents of the theory, Handler and Sarason (1952) started working on anxiety with the assumptions that: (1) study of anxiety should begin with the examination of particular stressful stimuli, and, (2) that test performance bears great significance for the individual, as the course of life is directed by it. Further, they contend that it's a 'near universal' experience. They selected the area of 'test anxiety' and developed Test Anxiety Scale to measure anxiety in classroom and examination situations. Test anxiety primarily refers to classroom evaluation. They regard anxiety as a strong learned drive but their concentration has mainly been on studying situation specific anxiety, i.e., test anxiety and not generalized properties of drive.

ANXIETY AS AN EMOTIONALLY BASED DRIVE:

Another approach followed by researchers has been
that of Hullian or drive theory approach. The concept of anxiety is largely used by experimental Psychologists to describe motivation. A great deal of work in the laboratory, dealing with the effect of anxiety on learning, has been influenced by theorizing of Hull (1943). Researchers in this tradition regard anxiety or drive primarily as a condition of an individual and secondarily as a function of external stimuli. Anxiety as a response produced strong stimulus with the functional characteristics of drive, was discussed by Miller and Dollard (1950). A number of investigators, Mowerer (1940), Farber (1948), Miller (1948), and Brown and Jacobs (1949) have conceived of anxiety in laboratory animals as acquired, not directly observable and an anticipatory response to pain. Anxiety, so defined, is assumed to have at least two of the functional properties of primary drives as these are treated in Hull-Spence formulations of the roles of drive. Its reduction should be reinforcing, or should strengthen responses immediately preceding it. Besides it should intensify any response tendencies that occur during its period of evocation. As a motivational construct is usually refers to unitary discriminable drive or drive-related state. In Hull-Spence system of approach emphasis is laid upon motivational rather than signaling properties of anxiety. Drive theory proceeds from Hull's (1943) assumption that strength of a given response (R) is a function of level of excitatory potential (E), determined by all habits (H) present, and activated in a given situation which combine
multiplicatively with the total effective drive (D) state, 
\[ R = f(E) = f( DxH) \]. It is envisaged as a generalized energizer 
of behaviour that combines indiscriminately with all habits present 
Total effective drive, in the Hullian system, is determined by 
the summation of all extant need states, primary and secondary 
irrespective of their source and their relevancy to the type 
of reinforcement employed. In more than the past two decades 
much research on anxiety has been stimulated by the theory of 
emotionally based drive, formulated by Taylor (1953, 1956), and 
Spence (1956). A large amount of work in the laboratory 
involving human beings, has been particularly concerned with 
the effect of anxiety on learning. Drive theory proper begins 
with two assumptions: (a) noxious or aversive stimuli arouse 
a hypothetical response, re and (b) drive level is a function 
of the strength of re.

Manifest Anxiety scale (MAS) was developed by Taylor 
(1953) to measure the emotional responsiveness. This indicates 
level of drive, and is based on Spence's theory. Anxiety has 
evidently been used in the sense of a constant characteristic 
or trait of the individual scores on MAS reflect differences 
in a chronic emotional state and also different potentialities 
for anxiety arousal. High anxiety (HA) subjects are apt to 
react more emotionally and adapt less readily to novel and 
threatening situations. Later, assumptions suggest that a 
situation has to be threatening in order to arouse differential 
levels of drive, and hence, cause magnitude of difference in
performance. This is further suggestive of the fact that difference in drive may depend in part on, situational factors. However, situations not employing any means to arouse anxiety may be having such factors inherent in the experimental arrangement, which induce anxiety states in the anxiety prone. It is certain that individual scoring high or low on anxiety scale differ in drive level and react differently. Whether level of anxiety is chronic or is a function of the strength of a particular stressful stimuli remains a tentative question (Spence and Spence, 1966).

PREDICTIONS OF DRIVE THEORY:

Since response strength is determined, in part, by E, the implication of varying drive level in any situation in which a single habit tendency is evoked is clear: the higher the drive, the greater the value of E and hence of response strength. Thus in simple noncompetitive experimental arrangements involving only a single habit tendency, the performance level of high D subjects should be greater than that for low D groups. Spence's theory is straightforward when applied to learning situations in which only one response is possible and occurs invariably, as is the case with conditioning, when there is no choice of responses. In such a situation high anxiety should, by energizing the individual to behave and facilitate learning.

It is hypothesized by the proponents of this theory that instances in which the initial habit strength, of the
correct response is stronger than the strength of competing responses, performance would be positively related to drive level. If the correct response is weaker than the competing response tendencies, higher drive would lead to poorer performance.

It generally happens in everyday living that one is exposed to situations containing more than one response. It so happens that in the maximum of such situations, in his response repertory, an individual has variety of available responses. Each of these response tendencies has a certain probability of occurrence, depending upon individual's past experiences and learning. These responses could theoretically be arranged in a hierarchy of habit strength. Spence's theory holds that anxiety will energize or strengthen each habit in an hierarchy in proportion to the initial strength of the habit. So in a situation of complex learning with many incorrect competing response tendencies, effect of anxiety as an energizer is to increase the habit strength of incorrect tendencies to the disadvantage of the lone correct-response. Learning, thus, proceeds very slow. With practice, sooner or later, correct response starts taking place more frequently, so position for the correct response tendency improves. Hence, effect of drive at this stage increases the habit strength of correct response more and more. Eventually a point is reached at which high drive starts facilitating learning.
Predictions concerning the performance of complex tasks involve the introduction of additional Hullian concepts: oscillatory inhibition \((O)\), and threshold \((L)\). \(O\) had been conceptualized by Hull as playing inhibitory role. The value of \(O\) varies from moment to moment and when subtracted from \(B\) yields momentary \(E\). Intra-individual variability in behaviour occurs because of uncontrolled variations within the organism and in his environment. To evoke response there has to be \(L\) value of \(E\), a value that is presumably similar for some habit tendencies (Moldawsky and Moldawsky, 1952). Probability of appearance of the correct response involves an interaction between drive level and the number and the comparative strengths of the correct and incorrect tendencies. Maximum inferiority of high \(D\) (subjects) is expected when there are too many incorrect, competing response tendencies and initial correct response is weak and low in hierarchy.

**EXTENSION OF DRIVE THEORY TO INCORPORATE INTELLIGENCE:**

Habit hierarchy is a function of an individual's past-experience. In any task it is a very complex problem to establish habit hierarchies for learning tasks. In all the experiments concerning effect of anxiety on learning, task difficulty itself is an important variable which should be manipulated. Task difficulty, in turn, is a function of \(S\)'s intelligence. Spielberger (1966) has recently suggested that inconsistent findings in studies of anxiety and learning may
result from the failure to evaluate the effects of individual differences, in intelligence. In this extension of Spence-Taylor Drive Theory Spielberger (1966a) hypothesizes that the relative strength of the correct and competing response tendencies elicited in a learning task, are a function of the intellectual level of the subject. In an earlier study, Spielberger (1962) surmised that drive has its pronounced effect only on Ss falling in the middle range of ability. The primary hypothesis from which the extension proceeds is that the difficulty level of the learning task will depend upon the intelligence level of the subject. For example, a task of moderate difficulty may evoke relatively few error tendencies in high IQ subjects, but this same task may generate numerous competing error tendencies in low IQ subjects. On such a task according to Drive Theory, high anxiety (drive) would be expected to facilitate the performance of high IQ subjects and impair the performance of low IQ subjects relative to their low anxiety counterparts (Denny, 1966; Gaudry & Spielberger, 1970). The prediction is based on the assumption, that high drive activates correct response tendencies, for the high IQ subjects than for low IQ subjects. Consequently, in investigations of the effects of anxiety (drive) on the learning process, the influence of individual differences in intellectual ability, should be evaluated at different stages of learning. On the average it can be said that there is a relationship between task complexity and the
effect of anxiety on learning, but in the individual case complexity itself depends upon the person's intelligence (Levitt, 1971, p. 156). On the basis of Spielberger's extension of the Spence-Taylor theory, it is predicted that anxiety and intelligence have an interactive effect on performance in early stages of learning. More specifically, it has been predicted that high anxiety tends to facilitate the performance of high IQ subjects and impair the performance of Ss with low IQ. However, after learning progresses to a point where correct responses are presumed to be highly dominant for most Ss, high anxiety would start facilitating performance even for the low ability Ss. In all types of learning effects of anxiety vary with the type of material used and the level of difficulty employed.

Research on anxiety and learning guided by the Spence-Taylor Drive Theory has suffered from ambiguity with regard to the status of anxiety as a theoretical concept. Spence (1958) contended that "in order to derive implications concerning the effects of drive variation in any type of complex learning task, it is necessary to have in addition to the drive theory, a further theoretical network concerning the variables and their interaction that are involved in the particular learning activity." In recent years Spielberger has done some remarkable work by attempting to integrate important segments of vast literature on anxiety outcome of which has been the publication of 'Anxiety and Behaviour' (1966)
and two volumes of "Anxiety: Current Trends in Theory and Research" and recent series on "Stress and Anxiety" by Sarason, I.G. and Spielberger (1975).

**STATE-TRAIT ANXIETY THEORY:**

In the framework of Spence-Taylor's emotionally based Drive theory as this concept is employed in Hull's learning theory, Spielberger and his associates have proposed a theoretical statement of the relationship between two different, yet related, aspects of anxiety: A-state (state-anxiety) and A-trait (Trait-anxiety). Initially influenced by Cattell and Scheier's (1961) factor-analytical approach to personality and their studies of moods and states, Spielberger maintained that ".....an adequate theory of anxiety must distinguish between anxiety as a transitory state and as a relatively stable personality trait" (Gautney and Spielberger, 1971). Failure to do this tends to obscure the meaning of anxiety as an emotional state and as a scientific construct. A significant flaw in psychological research has been that very little of it is concerned with the phenomenological and experiential aspects of emotional reactions.

Cattell and Scheier (1961) have pioneered in the application of multivariate techniques to the definition and measurement of anxiety, and state and trait anxiety have consistently emerged as principal personality factors. Cattell and Scheier (1961) has pointed out that our understanding of anxiety can not advance beyond the pre-scientific level until
Operational procedures are developed for the assessment of anxiety. His emphasis on the use of psychometric methods have resulted in the quantitative analysis of personality traits and states, which were otherwise thought to be beyond quantification.

Before proceeding to details of state-trait anxiety, theory and various terminological issues, it seems essential to say a few words about the importance of personality states and traits.

**Anxiety as a State**

Personality states may be regarded as temporal cross-sections in the life of a person; a personality state exists at a given moment in time, and at a particular level of intensity. Personality states are necessarily transitory in nature and can be evoked only by a suitable stimulus in a particular situation. They are as enduring as the evoking conditions. Quality and intensity are the unique and distinctive features of personality state.

State anxiety (A-state) has been conceptualized by Spielberger (1966) as a transitory emotional state or condition of human organism that varies in intensity and fluctuates over time. This condition is characterized by subjective, consciously perceived feelings of tension and apprehension, and activation of the autonomic nervous system (ANS). Level of A-State should be high in circumstances that are perceived by an individual to be threatening, irrespective of the objective danger; A-state intensity should be relatively low in
nonstressful situations, or in circumstances in which an existing danger is not perceived as threatening.

Ideally speaking, psychological states should be basic units of study in human behaviour (Thorne, 1966), but because of methodological problems, these have been largely overlooked. "States and moods have relatively been vague concepts in psychology. They can be given operational meaning and revealed in their rich variety by correlating behaviour and introspection over time....." (Cattell, 1966).

ANXIETY AS A TRAIT:

In general, personality traits have been described as relatively enduring individual differences among people in specifiable tendencies to perceive the world in a certain way and in dispositions to react or behave in a specified manner with predictable regularity. Personality traits reflect individual differences in the frequency and intensity that certain emotional states have been manifested and in the probability of occurrence of such states in future. Frequency and intensity of an emotional state depend upon the strength of personality traits.

Specifically, anxiety as a personality trait has been defined in terms of relatively stable individual differences in anxiety proneness, i.e., to perceive a variety of situations as threatening and to respond to these situations with differential elevations in state anxiety (Spielberger, 1966; 1972). A-Trait may also be regarded as reflecting individual
differences in the frequency and the intensity with which A-States have been manifested in the past, and the probability that such states will be experienced in the future. Persons who are high in A-Trait tend to perceive a large number of situations as dangerous or threatening than persons who are low in A-Trait, and to respond to threatening situations with A-State elevations of greater intensity.

Spielberger (1971) metaphorically described personality states and traits as kinetic and potential energy. "Personality states, like kinetic energy, refer to palpable empirical reactions or processes taking place here and now at a given level of intensity. Personality traits like potential energy, represent latent dispositions to respond with certain types of reaction if triggered by appropriate stimuli." While elucidating the importance of A-State, Spielberger (1972) asserted, "...much of the ambiguity and semantic confusion associated with the concept of anxiety resulted from more or less indiscriminate use of this term to refer to two related, yet logically very different concepts." Distinction between A-State and A-Trait has clarified semantic confusion considerably and has helped to procure anxiety a conceptual status as a scientific construct.

It is implied in State-Trait theory that research on anxiety and performance must specify the conditions under which anxiety states are aroused and takes into account the various kinds of stress. The intensity of the anxiety reaction
is proportional to the magnitude of external danger that evoke it, the greater the external danger, the stronger the perceived threat and the more intense the resulting reaction.

ANXIETY AS PROCESS:

Concept of anxiety as process refers to the sequence of cognitive, affective, and behavioural responses that occur as a reaction to some form of stress. This process may be initiated by a stressful external stimulus or by an internal cue that is perceived as threatening. In this stress, threat, state and trait anxiety are fundamental constructs or variables. The development of anxiety phenomena must begin with a definition of response properties of anxiety states (Spielberger, 1972, V.II, p.489). While an anxiety state lies at the core of the anxiety process, this process also involves stress, threat, physiological changes, and behavioural reactions. The concept of anxiety as process is reflected in the traditional distinction between fear and anxiety which is based on the assumption that similar emotional reactions result from the operation of different mediating processes. Thus, concept of anxiety-as-process implies a theory of anxiety that requires specification of the fundamental variables that are involved in the evocation of an anxiety state.

In general, the experimental literature on anxiety is, by and large, consistent with the hypothesis. The hypothesis that situations which pose direct or implied
threats to the integrity of self, produce differential levels of A-State in persons who differ in A-trait. Anxiety may be interpreted as a primer or sensitizer to stress effects (Katchmer, et.al., 1958). It mainly heightens the sensitivity of more anxious subjects to experimental stress. When there is insufficient stress in the experimental situation anxiety can not be produced.

Arousal of A-state or anxiety reaction depend upon the trait anxiety, the quality and intensity of a stressor which further depends upon the cognitive appraisal or threat perceived by the individual. Thus, an anxiety state is at the core of anxiety process, and the concept of anxiety-as-process usually implies the following temporally-ordered sequence of events. The relationship between stress, threat and A-state can be shown as follows:

Stress - Threat - A-State

"Stress refers to variations in environmental conditions or circumstances that are characterized by some degree of objective danger. Threat refers to the subjective appraisal or interpretations of a particular situation as ominous, frightening or dangerous. The term A-state refers to the complex emotional reaction that is evoked in an individual who interprets a stressful situation as personally threatening to him", (Gaudry and Spielberger, 1971). Hence, anxiety is differentially aroused in different subjects by personal threat or ego-stress instructions (Sarason, 1960; Sarason, 1961; Denny, 1966).
PREDICTIONS OF STATE-TRAIT ANXIETY THEORY

According to State-Trait Anxiety Theory (Spielberger, 1971) it has been predicted that the stress condition would evoke higher levels of A-state, and that high A-trait subjects would display higher levels of A-state than low A-trait subjects throughout the learning task. Further, during the performance period, high A-trait Ss in the stress condition would respond with greater increments in A-state intensity than low A-trait Ss. For the non-stress condition increments in A-state are expected to be independent of level of A-trait. Within Hull's theoretical framework all the habit tendencies activated by a given stimulus are considered to be multiplied by the total drive operating. This theoretical formulation holds two somewhat related predictions for performance measures: the higher the total drive state, the more likely is the occurrence of the strongest response tendency, but also with high drive states, the greater is the total number of response tendencies that are above threshold (O'Neil, 1972).

While the requirement to perform on difficult tasks may evoke high levels of A-state in most individuals with high A-Trait, such tasks are not likely to be regarded as threatening by high A-Trait persons who have the requisite skills and experience to do well on them. Conversely, a task or situation that most people would find nonthreatening might be regarded as extremely dangerous by a particular low A-Trait individual for whom it had special traumatic significance. Thus, while measures of A-Trait provide useful information regarding the
probability that high levels of A-State will be aroused, the impact of any given situation on the intensity of A-State can only be ascertained by taking actual measurements of A-State in that situation.

The starting point for a comprehensive theory of anxiety is in identifying the variables that are central to the theory, and in specification of precise operations for measuring each variable. It is only then that the relationships among these variables can be empirically verified.

State-trait theory of anxiety (Spielberger, 1966; 1972a, 1972b, 1975a, 1975b) provides a conceptual framework for identifying and classifying the major variables that should be considered in anxiety research (e.g., stress, cognitive appraisal of threat, psychological defenses), and suggests possible inter-relationships among these variables. Psychological stressors that produce threats to self-esteem evoke higher levels of A-state intensity in high A-trait individuals than in persons low in A-trait.

Both Trait-State Anxiety Theory and Test Anxiety Theory assume that test situations evoke emotional reactions and task-irrelevant responses. Furthermore, the psychological stressors that evoke differential A-state reactions in persons who differ in A-trait are similar, in many respects, to the evaluative conditions that influence differentially the performance of persons who differ in test anxiety (a situation-specific trait anxiety). The two theories differ, however, in the relative amount of emphasis given to the worry and emotionality components
of anxiety.

While test anxiety theory recognizes that emotional reactions (A-states) occur in evaluative situations, it is worry rather than emotionality that contributes most to performance decrements. Morris and Liebert (1969) contend that, "It is worry, not 'anxiety' which affects performance on intellectual-cognitive tasks and which interacts with the relevant variables of the test situation (pp. 243-244)."

Sarason (1972) has also suggested that worry rather than emotionality produces performance decrements in test anxious persons. In a recent paper, Sarason (1975, p. 177) concludes that: (1) "test anxiety would appear to be a type of trait anxiety"; (2) "as a person's anxiety level increases, it is understandable that he should worry and search the environment for helpful cues."

In the context of Trait-State Anxiety Theory, Spielberger (1972b) conceptualizes test anxiety as a situation-specific form of trait anxiety. Intense A-state reactions in testing situations seem to correspond to Liebert and Morris (1967) emotionality component of test anxiety. It is very essential to take into account both the worry that characterizes test anxious persons and the emotionality that they experience in testing situations. The concept of test anxiety seem to imply a situation-specific personality trait.
THE MEASUREMENT OF ANXIETY:

Although a very large number of anxiety scales are available now a days here, only few very frequently used anxiety measures are described very briefly in the following pages. Much of the experimental work on anxiety followed the development and publication of the Manifest Anxiety Scale (MAS) by Taylor (1953). The development of the MAS was stimulated by the work of the learning theorist K.W. Spence. The MAS is regarded as a measure of drive or general "trait" or predisposition to experience anxiety. Subjects are not required to report their emotional state as it exists at a particular moment in time. The children Manifest Anxiety Scale (CMAS) was developed by Castaño, McCandless and Palermo (1956) as a measure of trait anxiety in children.

The Test Anxiety Questionnaire (TAQ) was constructed by Mandler and Sarason (1952) to measure the anxiety reactions of adults taking course examinations or intelligence tests. The Test Anxiety Scale (TAS) is a high school version (Mandler and Cowen, 1958). The Test Anxiety Scale for children (TASC) was developed by Sarason and his colleagues (Sarason, Davidson, Lighthall, Waite and Ruebush, 1960) as a measure of anxiety that is aroused in children by tests or test-like situations. Sarason's conception of anxiety is influenced by psychoanalytic theory which holds that development of anxiety takes place in the family setting from the earliest years of life. The TASC contains 30 questions.

Alpert and Haber (1960) constructed the Achievement Anxiety Test (AAT) to identify individuals whose academic
performance is 'facilitated' (AAT+) by the stress of the test situation, as well as those whose performance is 'impaired' (AAT-). Hence, the AAT consists of two scales, a nine-item AAT+, and a ten-item AAT-.

All the anxiety measures mentioned above are measures of anxiety as a trait, (may it be a situation specific trait). The IPAT 8-Parallel Form Anxiety Battery was developed by Scheier and Cattell (1960) for the "repeated measurement of changes in anxiety level over time." A very limited validity data has been reported for this test as a measure of state anxiety. It requires subjects to report only the frequency, and not the intensity, of a certain experience, in the past. It seems more likely that this scale (IPAT 8-Parallel Form Anxiety Battery) is more closely related to trait anxiety than to state anxiety.

Zuckerman and his associates (1960) developed the Affect Adjective Checklist (AACL) to measure both state and trait anxiety. A-State is measured with the "Today" version of AACL and there is strong evidence for the validity of 'Today' form, but it's more vulnerable to social desirability effects in the measurement of transitory anxiety (Cumming, 1968, p.73).

The State-Trait Anxiety Inventory (STAI) was developed (Spielberger and Gorsuch, 1966; Spielberger, Gorsuch and Lushene, 1970) to provide reliable, relatively brief, self-report measures of both State and Trait anxiety.
To measure A-Trait, STAI A-Trait Scale is administered with instructions that require the subject to report his typical anxiety level ("indicate how you generally feel"). Each individual item is highly correlated with other anxiety scales that are measures of individual differences in A-Trait (TMAS and the IPAT Anxiety Scale). Test anxiety scales are moderately correlated with general A-Trait measures and appear to reflect a specific type of trait anxiety.

When A-State is to be measured, the STAI A-State is administered with instructions that require the subject to report his present feelings ("indicate how you feel right now"). Each item reflects S's level of anxiety at a particular time.

The test retest reliability of the STAI A-Trait scale is found to be stable over time and impervious to stress, in contrast to fluctuations in STAI A-State scores in response to various types of stress stimuli. Its construct and concurrent validity has been testified in a number of studies (e.g. Spielberger, O'Neil & Hansen, 1971). The internal consistency of the STAI A-Trait and A-State scales is high. Its construct and concurrent validity has been testified in a number of studies (e.g. Spielberger et. al., 1970; Spielberger, 1972).
CONCEPT OF PSYCHOLOGICAL STRESS

"Stress is one of those peculiar terms which is understood by everyone when used in a very general context but understood by very few when an operational definition is desired which is sufficiently specific to enable the precise testing of certain relationships", (Cohen, 1967, p. 78).

In general, stress occurs when there is substantial imbalance between environmental demand and the response capability of the organism. Selye defined stress as the "biologic equivalent of physical stress"; as the result of "the interaction between a force and the resistance opposed to it". Such a definition of stress as a disturbance of normal functioning is in agreement with Selye's original use of the term. When a man's psychological functioning is severely disturbed by suffering a loss or when he can not achieve what he wants, he experiences disturbance.

At the biological level, stress has generally been conceptualized as an insulting agent, external to the organism, to which the organism responds. The stressor is thus something that happens to the organism (Sells, 1970). In this respect stress has been presumed to be a function of the dangers and threatening circumstances and predisposition of the personality and background of the individual.

Psychologists vary on the issue of whether stress is an external entity or state of the total organism. Weitz (1966) feels that stress is a stimulus variable, while Appley and Trumbell (1967) have taken the position that "stress is probably
best conceived as a state of the total organism under extenuating circumstances rather than as an event in the environment, " (p. 11). However, "state of organism" is more appropriate than either external or internal processes, since the interaction of the two producing a state, is more consistent with the data of behaviour (Sells, 1963, 1966). Moreover, we can not rely upon the stimulus only. It is important to look into some pattern of stimulus-organism interaction to understand why stress occurs in some exposed organisms and not in others.

Stress can not be an all-or-none affair and the assumption of all-or-none psycho-physiological stress state does not seem to be very sound in the face of available contrary evidence. James Miller and associates (1953) concluded that "in a specific situation it becomes necessary to recognize the many different kinds of stress" (p.A-4). Lazarus, Deese and Osler (1952) surmised that the effect of stress "will depend upon what the individual expects or demands of himself" (p. 296). Appley (1962) emphasized the importance of "threat perception" and earlier a similar point was made by Pascal (1951) in defining stress "in terms of perceived environmental situation which threatens the gratification of needs,..." (p. 177). Basowitz, Persky, Korchin, and Grinker (1955) also considered stress as a response to internal or external processes which are thought to be beyond limits.
There are a number of pre-requisites in stress research and most important, by and large, remains to be Lazarus' (1966) concept of 'Cognitive appraisal'. It further implies the difference between the terms 'stress' and 'threat'. An environmental demand can not produce stress if the organism is able to cope with the situation. On the contrary when he anticipates that he will not be able to face the situation adequately there will be stress. Therefore, stress seems to be imbalance between the perceived or subjective demand and perceived response capability. One is threatened by the anticipation that he will not be able to handle the perceived demands adequately. This makes the cognitive appraisal of a demand capability imbalance the key condition for 'threat' or 'psychological stress'.

Coley & Appley (1964) defined stress as "the state of an organism where he perceives that his well-being (or integrity) is endangered and that he must divert all his energies to its protection" (p. 453). Arnold (1967) thought it impossible to talk of psychological stress without giving attention to subjective evaluation. According to her whether a particular difficulty is felt as psychological stress, appraised as a threat and results in contending emotion, depends entirely on the state of his mind as much as on the objective situation. "What is stress for one man may be a welcome challenge for another" (p. 124).

It is evident from various definitions and views cited earlier that an area in which separation of psychological from physical aspects is required is that of "Threat".
In stress studies very often the experimenter assumes that the situation should have been threatening had he been the subject. A very important point in such studies is first to determine how the subject perceived the stimulus. Obviously threat does not threaten unless it is evaluated as threatening by the subject. Furthermore, it is important to know how such appraisal (intervening factors) goes on. It is quite certain that intervening between the stressful stimulus and stress research are a variety of operations including cognitive appraisal.

An individual experiences emotional stress when his over all adjustment is threatened. In one's ability to cope with stress two important factors are individual's early identifications and his character structure (Lazarus, Deese, and Hamilton, 1952). Research in the area of the relationship between various personality measures and reactions to stress has been very little.

"Not only must a situation be of a given intensity to lead to stress, it must also be of a given kind for a particular person" (Appley and Trumbell, 1967, p. 10). Motivational structure and prior history of an individual have to be taken into account. Although an individual's vulnerability to stress is a very important factor, yet it does interact with extra individual or social factors, such as the social motivation and social facilitation. Besides these there are physical and physiological factors in stress. To sum up stress is a concept which can have interpretations and relevance from cellular to cultural level.
Appley and Trumbell (1967, p.401) concluded that:
(1) individual differences in reactions to situations are great; (2) stress measures reflecting differences organismic subsystems and different criteria are largely unrelated; (3) that responses vary from situation to situation and that variation is greatest between laboratory and life situation; (4) the social context is of major importance in understanding stress reactions and that social and other environmental supports have often been overlooked in evaluating particular behaviour; (5) stress, as other behaviour, is best understood as interaction of individual and situation; and (6) in evaluating such interactions, inner events should be taken into consideration.

Theory of stress as presented by Sells (1970) is consistent with the above generalizations. It is interactional; it provides for individual differences, variability of measures, variability of situations, social context, and implicit inner reactions. Stress reactions are, by and large, a function of cognitive control rather than of emotions. This view seems to integrate the psychological and physical stress phenomena.

Usually stress arises under the following conditions:
(a) The individual is called upon in a situation to respond to circumstances for which he has no adequate response available, the unavailability may be due to physical inadequacy; absence of the response in the individual's response repertoire, lack of training, equipment, or opportunity to prepare; (b) the consequences of failure to respond effectively are important
to the individual, personal involvement in situations can be defined in terms of importance of consequences to the individual. Stress intensity depends upon the importance of an individual's involvement and the individual's assessment of the consequences of his inability to respond effectively to the situation.

"Some individuals, because of training, conditioning, habituation, prior experience, equipment, expectation, support or other mitigating factors may be able to perform effectively under stimulus conditions that far exceed the capabilities of others. It is more important to determine the onset of stress in terms of the individual's ability to make an effective response and his assessment of the consequences of failure rather than in terms of the stimulus conditions or the personality profiles", (Sells, 1970, p. 138).

Psychological stress analysis is distinguished from other types of stress analysis by the intervening variable of threat, a state in which the individual anticipates harm. Stimuli resulting in threat or nonthreat reactions are cues that signify to the individual, some future condition, either harmful, benign, or beneficial.

Situational stress plays a critical role in evoking differences in drive level for persons who differ in anxiety proneness and as a variable accounts for the effect of stress on anxiety arousal in research on anxiety and learning. The term stress denotes environmental conditions or circumstances that are in some way or the other 'threats' to the ego of an individual. Carron (1971) accurately observes that there are
individual differences in state anxiety response to identical stressful environments. The appraisal of a situation as dangerous or threatening will be determined by individual differences in aptitudes, personal experiences, and personality dispositions (traits).

Different personality characteristics create greater sensitivity to different types of stress. A number of categories seem to involve stress based on physical threat (shock), interpersonal threat (social comparison), impoverished environment (deprivation of food, sleep, interaction), and psychological stress (ego-threat). Ego-threat is a major source of stress. Circumstances that involve the risk of failure, such as academic achievement situation (e.g. Mandler and Sarason, 1952; Spielberger, 1962).

The administration of stress in laboratory situations is possible through physical pain and threat of injury, intense sensory stimulation, deprivation of physiological need, frustration of goal directed behaviour, failure and conflict. These techniques according to Lazarus, Deese and Osler (1952) fall into two main categories: (a) stress induced through failure (b) stress induced by working conditions, as the task itself.

Several experimenters have studied the effects of stress upon intelligence, primarily verbal, in children. An examination by Lantz (1945) of the differential effects of failure experience upon the various subtests indicated that task requiring visual or rote memory were not affected, while those involving reasoning or thinking suffered a decrement.
Zeller (1956), working with nonsense syllables found a decrement in recall and relearning following an experience of failure.

Among other factors, anxiety has frequently been considered an important variable determining performance under stress. The data bearing on the interaction between MAS scores and stress in determining performance on complex learning tasks, have employed three major types of stress conditions singly or in combination. These are ego-involving instructions, induced failure experience on a prior task, and application of noxious stimulation such as electric shock. The findings have demonstrated all varieties of relationship, suggesting that these stress conditions are complex in their effect and interact with a number of variables to determine performance (e.g. Farber, 1955; Lazarus, Deese and Osler, 1952, etc.).

There is evidence that persons with high A-trait do not perceive physical dangers as anymore threatening than low A-trait (e.g., Basowitz, et.al., 1955). Increment in A-state intensity produced by shock threat was unrelated to the level of A-trait (Katkin, 1965; Hodges and Spielberger, 1966; Spielberger, et al., 1970; Lushene, 1970). A crucial aspect in any stress experiment is the creation of a realistic situation. Besides the studies involving natural stressful situation (Walk, 1956; Baswitz, et al, 1955) almost all studies, dealing with effects of anxiety on learning, induced anxiety through artificial means.
Experimental situation in which anxiety is induced using 'Ego-stress' instructions, a most serious methodological problem is the validity of the technique employed for the purpose. Anxiety, thus aroused, seem to be mild as compared to natural stress situation, but it is usually not possible to have a naturally occurring stress situation in the laboratory. Hence, there always remains some doubt about the intensity of anxiety aroused through artificial means. Another problem is whether there are consistent differences in the effect of stress on anxious and non-anxious individuals.

The object of introducing ego-stress in the present study has been two-fold: first, to arouse differential levels of A-state in high and low A-trait individuals; and second, to provide further evidence whether anxiety is chronic or reactive in nature.

Relation between measures of state and trait anxiety and performance has been investigated by Hodges and Spielberger (1969), O'Neil, et al. (1969), Spielberger and Smith (1966), Spielberger, et al. (1970). A consistent finding has been that only the conditions that threaten the self-esteem of the organism will evoke higher levels of A-states especially in individuals who are high in A-trait.

Any systematic program of research must take into account the difficulty of producing realistic stress situations and making effective measurements of the stress effects which are independent of the skills required by the task itself (Lazarus, Deese, and Osler, 1952).
It is quite interesting to know what kind of individuals develop anxiety reaction as a result of induced-stress. Is it always the one who is highly anxious or is there no set-pattern for this? May be people who are stressed easily are highly motivated to perform well. A thorough understanding of anyone's performance under stress depends upon measuring the strength of motivation and also on examining the situation in which he has to perform.

One strong emphasis within stress research has been on the use of task performance as indices of degree of stress, usually with the presumption that the greater the stress, the more the performance decrement, but one would never know for certain why it is so. It's important to find out truly psychological factors involved, what must be taken into account is not only the objective reality of any given situation, as perceived by an independent observer, but also the series of subtle subjective elements involving an individual's assessments of possible success or failure in motive satisfaction.

Some investigators (e.g. Coffer and Appley, 1964; Martens, 1971; Carron, 1971) equate A-state with stress and hold that these terms may be used interchangeably. But doing this, as Spielberger observed, ".....tends to obscure a fundamental distinction between the properties of anxiety as a reaction or emotional state and the stimuli that evoke this reaction", (1966, 1971). As mentioned earlier, Spielberger contends "...the terms 'stress' and 'threat'
be used to denote different aspects of a temporal sequence of events that result in the evocation of an anxiety state" (1971).

A major task for a trait-state theory of anxiety is to specify and delineate the characteristics of stressor stimuli that evoke differential levels of A-State in persons who differ in A-Trait. Sarason (1960) emphasized the special significance for high A-Trait individuals of experimental situations that arouse self-deprecating tendencies. "...highly motivating or ego-involving instructions serve the function of arousing these self-oriented tendencies", (Sarason, 1960, pp.401-402.). It is important to follow systematic approach on the problem of quantitative analysis of stressors to produce valid answers to both theoretical and practical problems in personality and behaviour.
Possibly more words have been used in trying to define intelligence, than for any other psychological concept. The attempts roughly fall into three groups. Early definitions were intuitive: they were merely assertions that intelligence is the ability to learn or solve problems. Secondly, there are logical or philosophical attempts, of which probably the most famous is that of Gilbert Ryle (1949). The essence was that intelligence is not an entity, but something overall. When we say that an individual is intelligent we mean that he characteristically acts in intelligent ways in all, or many, of the things he does. The third and most preferred approach by psychologists has been that of empirical/theoretical one. The main division of opinion here is between those who favour some general factor and those who prefer to conceive of a number of separate factors.

The pursuit of 'general intelligence' or 'g', as it came to be known, was carried on by Cyril Burt who formulated his notion of 'innate, general, cognitive efficiency' as early as 1909 and vigorously campaigned for it all his life. Spearman (1927) developed two factor theory according to which all intellectual operations involve a single, common factor (g) and a specific factor (s) for each performance. This general factor can therefore be defined as 'general intelligence' although Spearman interpreted it hypothetically as general mental energy.
Opposed to Spearman’s two factor approach is that of Thorndike’s (1927) multifactor theory of intelligence. According to this view, there is really no such thing as ‘general intelligence’, there are only highly specific acts. Thorndike divided intelligent activity into three types: (1) Social intelligence, or ability to understand and deal with persons; (2) Concrete intelligence or ability to understand and deal with things as in skilled trades and scientific appliances; (3) abstract intelligence or ability to understand and deal with verbal and mathematical symbols”, (p. 157). Of these three kinds of ability, abstract intelligence is the one that receives greatest weight and is most pronounced in current tests of intelligence.

Thurston (1938) felt that evidence justified seven ‘primary mental abilities’: spatial ability, perceptual speed; numerical ability; memory; verbal meaning; verbal fluency; inductive reasoning. Guilford (1967) later argued that any account of intellectual abilities must deal with three classes of variables: the operations performed; the material or content on which operations are performed; and the product which is the result of operations and this yields 120 mental factors.

Concepts of intelligence and the definitions constructed to enunciate these concepts abound by the dozens. Two very comprehensive definitions have been given by Wechsler (1943) and Stoddard (1943). Wechsler states: “Intelligence is the aggregate or global capacity of the individual to act
purposefully, to think rationally and to deal effectively with his environment” (p.3).

Stoddard offers the following definition, “intelligence is the ability to undertake activities that are characterized by (1) difficulty, (2) complexity, (3) abstractness, (4) economy, (5) adaptiveness to a goal, (6) social value, (7) the emergence of originals, and to maintain such activities under conditions that demand a concentration of energy and a resistance to emotional forces”, (p.4).

Some psychologists and especially psychometricians have attempted to differentiate between intelligence as an innate capacity and as an acquired-environmental phenomena. In a similar vein D.O. Hebb (1949) in a book 'The Organization of Behaviour' emphasized that rather than speaking of intelligence as 'an innate ability' it’s more appropriate to talk of the 'potential to develop an ability'. Hebb distinguished between what he termed intelligence A, which is innate potential and intelligence B, which is the functioning of a brain in which development has gone on. He argued that intelligence A can not be measured directly, its evidence comes through intelligence B.

In more recent years Cattell (1963) has suggested that a distinction should be made between fluid and crystallized ability, i.e., potentiality for intellectual achievement from acquired knowledge. Jensen (1967) has suggested a division between associative ability (level I) and reasoning ability (level II), measured by tests of rote learning and of the
education of relations respectively. Butcher (1968) expressed his view that like all descriptive systems there is no one 'true' scheme which must prevail, but different schemes may serve different purposes.

It is true that there is yet no generally recognized definition of the term intelligence. Admittedly it denotes an ability, i.e., a condition or complex of conditions for specific performances or achievements. The definition of intelligence as the ability to overcome difficulties in new situations is most widely accepted today. Many modern psychologists have given up the use of the term intelligence in the technical sense and prefer terms like 'human abilities'. Ability means all the psychological conditions needed to perform an activity. Ability or intelligence is frequently defined as that which is measured by an intelligence test. This follows that there are as many different abilities as there are activities.

To sum up intelligence is what an intelligence test measures and "intelligence test" covers psychological test methods designed to determine inter-individual differences in the sphere of human intelligence. Normally the designation "intelligence test" implies that the method concerned is assumed to measure "general intelligence" and not partial aspects of the latter. Galton was the first to organize relatively large scale systematic experiments to detect inter-individual differences in intelligence.
Different intelligence tests are sometimes based on highly divergent models of intelligence.

There are individual as well as group tests or scales depending upon their mode of administration. Most group tests are constructed on the principle, that intelligence is a general capacity and it should be measured by sampling a variety of mental activities. They include, in various combinations such items as: following directions, arithmetical problems, practical judgement, word meaning, completion of number series, verbal analogies, information, etc. Items of each type are placed together beginning with the easiest and progressing by intervals to the most difficult. That way every individual can manage to get some items correct and proceed to his level of maximum difficulty in that type of mental activity.

Certainly what intelligence tests measure is not absolutely independent of the learning phenomena. All intelligence tests may be classed as aptitude tests (potential ability tests) and scores on aptitude tests be predictive of scholastic or other achievements. It is now largely believed that what achievement tests measure is what the examinee has learned and aptitude test measure what he can learn.

Customary failure of psychometrists to take into account personality differences in analyzing intelligence tests is a source of weakness. Intelligence is considered to be a characteristic of personality. This implies that
the personality is not completely characterized if intelligence is overlooked. It is quite important to decide whether there are relations between cognitive and non-cognitive phenomena, the latter including primarily motivational and affective phenomena. It is a known fact that test performance is influenced by motivation, anxiety and certain other personality characteristics.