Anxiety is peculiarly a human phenomenon, and is considered to be a unique contribution of the 20th century to mankind. So much so that the 20th century has been called "the age of anxiety". However, it is not only today that fear and anxiety have become fundamental human emotions, the universality of these emotions as basic conditions of human existence was even recognized by many renowned philosophers and existentialist thinkers of 19th century.

Fear or anxiety has evolved over countless generations as an adaptive mechanism for coping with danger. In his book, "The Expression of Emotion in Man and Animals", first published in 1872, Charles Darwin reasoned that the nature of fear reactions was shaped through a process of natural selection. He vividly described typical manifestations of fear as,

".......rapid palpitation of heart, trembling, increased perspiration, erection of hair, dryness of mouth, change in voice quality, dilation of the pupils, and the like," the above are very close to the symptoms of anxiety. Darwin also noted that fear reactions varied in intensity, from mere attention or surprise to an extreme degree of panic or terror, whereas anxiety does not always appear in intense or violent form. Another distinction between fear and anxiety is that the former is episodic and the latter chronic. That is not fear which relates to a definite state of affairs. Anxiety is not directed to any
concrete object but is, "a complex of presentiments which, though nothing in themselves, develop themselves in themselves", (Price, 1963, p.46). Kierkegaard (1944) contends that, "...the very way he is constituted, man is subject to tension and this tension is anxiety." The unique characteristic of anxiety is that it appears to be causeless, its origin lies deep rooted, unknown to the victim, who only knows that he has been struck by something but does not know why.

In attempting to explicate the meaning of anxiety within the context of psychological theory, Freud (1933) was especially concerned with identifying the sources of stressful stimulation that evoked anxiety reactions, and with clarifying the effects of anxiety on symptom formation and behaviour.

Although before the turn of this century, the problem of anxiety was never approached methodically, yet with the passage of time it has gained unbelievably widespread importance and in today's life it is considered to be "...a fundamental explanatory concept in most theories of personality and psychopathology, and is generally regarded as a causative agent for such diverse behavioural consequences as insomnia, debilitating psychological and psychosomatic symptoms, immoral and sinful acts and even instances of creative self-expression," (Spielberger, 1975, p.714).

Anxiety has become conspicuous in present times largely because it is an era of changing and rather individualistic values, alienation, competition and achievement. Achievement in itself has become more or less a power symbol and way of life.
However, even if the course of life is not determined by achievement, it is essentially directed by it. Hence, every individual is obsessed by social and psychological pressures to achieve more and more. These pressures later lead to various tensions and strains. Such resulting tensions are more often disruptive and result in performance decrements and discrepancies between potential and performance. Anxiety has, then almost wholly captivated the attention of numerous psychologists and investigators, in theory and research. This is due to the increasing awareness of its far-flung influence in the field of learning, in general, and educational achievement, in specific.

Anxiety as a normal phenomena, does not as a drive or energizer to achieve or to perform. A moderate amount of anxiety energizes the individual and thereby improves performance; but as a pathological phenomena it impairs the capacity to think and act freely. A high level of anxiety therefore interferes with the acquiring process, so that performance is either similar or lower to that obtained with low drive. For example, it has been often observed by teachers and counsellors that students who approached clinics for counselling have reported some kind of emotional blockaging experience during an examination or other similar stressful situations (Spielberger, 1966, p.362), leading to performances much below the potential. So much of talent either goes waste or remains unnoticed due to limitations as anxiety. In any sensible educational system pursuit of excellence, through proper development and nourishment of talent, then is a vital goal.
Two points of contact between the suffering student and the psychology of learning are found in the investigations of test anxiety (Handler & Sarason, 1952; Sarason, Mandler & Craighill, 1952) and in the studies of the effects of individual differences in emotionally based drive (anxiety) on learning process (e.g., Spence & Farben, 1953; Taylor & Spence, 1952). Important issues that arise out of these investigations are firstly whether the findings have any practical, applicable value for the students, and the clinician or the teacher who is called upon to help the emotionally disturbed students with their learning problems. Secondly, whether the theory on which researches are based can be extended to encompass the complex learning processes involved in academic achievement - meaning thereby, whether the findings in a laboratory could be carried over to real life learning. Although the study of personality factors as predictors of academic achievement has claimed the attention of a number of research workers, yet, it seems rather unfortunate that the learning problems observed in clinics have been so remote from the research problems addressed by psychologist who investigate learning in the laboratory.

In learning theory terminology (Dollard and Miller, 1950), the anxiety state may be viewed as having both stimulus-cue and stimulus-drive properties. The cue-properties may be regarded as providing basis for Freud's conception of anxiety as a "danger signal". A large number of researches, pertaining to anxiety and learning, have been initiated and conducted by Mandler and Sarason (1952). Present research, however, has been
particularly concerned with the arousal or drive properties of anxiety and its effects on behaviour especially behaviour in a learning situation. The study is based on the theory of emotionally based drive (Spence, 1956; Spence, 1958; Taylor, 1956) in which it is assumed that there are important individual differences in emotional responsiveness that contribute to drive level. It further implies that whether a particular situation would arouse or induce anxiety depends on individual's personality make up, inherent danger or threat in the situation and perception of the situation, as threatening.

Earlier investigators in the drive theory tradition exposed their subjects to ego-involving or failure instructions in order to create stress in the experimental situation and arouse anxiety. According to Spielberger (1971) core variables that should be considered in anxiety research are stress, threat (cognitive appraisal of stress) and psychological defenses. A very serious problem in anxiety research has been the fact that the terms 'stress' and 'anxiety' have been used interchangeably by many researchers. A comprehensive theory of anxiety must differentiate between the situations that evoke anxiety reactions, the properties of anxiety states, the complex psycho-biological processes that mediate between stressful stimuli and emotional responses, and the nature of anxiety as a process and as a personality trait.

In order to explain the complex effects of anxiety on performance, a theory of learning is required that takes into account both the drive properties and the interfering response properties of anxiety states. Drive theory is primarily
concerned with the strength of the correct responses and the interfering error tendencies that are aroused in learning tasks. Spielberger has proposed a conceptual framework, based on the drive or arousal properties of anxiety, known as State-Trait Anxiety Theory (STAT, Spielberger, 1966, 1971, 1972) for identifying and classifying the major variables in anxiety research. He suggests that a distinction should always be made between anxiety as a transitory state (A-State) and as a relatively Stable personality trait (A-Trait).

In Spielberger's formulations effects of different kinds of stressors on state anxiety is a central feature. According to State-Trait Anxiety Theory (STAT), ego-involving conditions are expected to evoke higher levels of state anxiety in high-anxious that in low-anxious subjects and presumably, higher levels of drive (D). Ideally, research on anxiety and learning should take into account the nature and amount of stress involved and its differential impact on level of state-anxiety (A-State) in subjects who differ in trait-anxiety (A-Trait). While Spence Drive Theory does not differentiate between trait and state anxiety, it seems more logical to infer differences in drive from measures of A-State than to select subjects who are presumed to differ in drive on the basis of their A-trait scores.

With regard to the relationship between A-Trait and A-State and performance, it is to be noted that conditions or circumstances which threaten the integrity of the organism will evoke higher levels of A-States in individuals who are high in A-Trait. As such ego-stress seems to be a very important variable in anxiety research and should be administered invariably to obtain clear differences, (Hodges and Spielberger, 1969; Spence and Spence, 1966; Spielberger and Smith, 1966; Hodges and Felling, 1970).
Any typical stressor produce a state of stress only if it threatens important ego-motivations of the subject. Thus, if the experience casts doubt on the intellectual adequacy of a subject who has a very strong motivation to achieve intellectually, there will be a marked degree of stress. Students are usually sensitive regarding such matters as intellectual capability, they consider it below their prestige to be told that they are, in anyway, inadequate or that their performance is not up to the point, their ego is involved easily. On a student sample, ego-involving instructions which are more or less a failure seem to be a relatively better tool for inducing stress successfully and in a realistic way.

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. Stress depends upon the anticipation of threat, beliefs, expectations about events, past experience and the present stimulus configuration. All these factors determine whether or not a stimulus will be reacted to as threatening (Lazarus, 1964). Thus, a stressful situation may not be perceived as threatening by an individual who either does not recognize the inherent danger, or who has the necessary skills and experience to cope with it. The concept of threat implies that objectively nonstressful situations may be subjectively appraised as dangerous by persons who, for some reason perceive them as personally threatening. In general,
the appraisal of a particular situation as threatening is determined by the objective stimulus characteristics of the situation.

Besides the core variables suggested by Spielberger, some other variables that are of importance in substantiating anxiety effects are intelligence and task difficulty. Proponents of drive theory, concentrated primarily on investigating effects of anxiety as a function of task difficulty, which in turn depends upon the intelligence level of the subject. Spielberger (1966) has extended the Drive Theory to incorporate the individual differences in intelligence, and thus takes into account the following variables: difficulty of the learning task, stages of learning and type of performance measure. The primary hypothesis from which the extension proceeds is that the difficulty of learning task will depend upon the intelligence level of the subject.

Attempts have been made to explore the relationship between anxiety and intelligence. Spielberger (1966) noted that as mean ACE increased, the size of negative correlation between MAS and ACE decreased monotonically. A hypothetical model has been proposed by Spielberger (1966) that a small negative correlation between anxiety and intelligence may be found if one samples a wide range of intelligence and if the sample contains a sizeable proportions of subjects with lower ability. The predictions of this extension of Drive Theory for easy tasks were tested by Gaudry and Spielberger (1970) and a confirming evidence was obtained. Dewey (1966) has also
provided confirming evidence for task of moderate difficulty level.

Cattell has pointed out that knowledge about anxiety can not advance beyond a pre-scientific level until operational procedures are developed for the exploration and assessment of anxiety (Cattell and Scheier, 1961). A fortunate event with regard to research in anxiety has been the development and use of scales for the measurement of anxiety. Investigators in the Drive Theory tradition have been frequently using Taylor Manifest Anxiety Scale (1953) as a measure of trait-anxiety (A-trait). In recent years, Spielberger, Gorsuch, and Lushene (1970) have developed the State-Trait Anxiety Inventory (STAI) to measure two distinct anxiety concepts.

Present Study:

The present research aims at investigating the 'Effects of State and Trait Anxiety, Psychological (ego) stress and Intelligence on Learning (laboratory learning) and academic achievement (real-life learning)' . It has already been briefly explained as to why anxiety (also state-trait anxiety), ego-stress and intelligence are considered important and have been selected for present research.

A large amount of research work in the laboratory has been particularly concerned with the arousal or drive properties of anxiety, which have been of research interest especially because, in that, instrumental responses are learned as a way of achieving drive reduction. In the Hull-Spence theoretical
system drive is said to have utilized the manipulation of anxiety to test hypotheses derived from that proposition.

Studies influenced by the theory of emotionally based drive (e.g. Spence, 1956; Spence, 1958; Taylor, 1956) assumed that there are important individual differences in emotional responsiveness that contribute to drive level. An experimental arrangement which provides detailed knowledge of S-R tendencies and permits analysis of results in terms of the actual drive present at that time, makes deductions from the theory more accurate and more possible. It implies that any research that is designed to investigate effects of anxiety and stress upon performance must not overlook the importance of obtaining measures of A-State in the experimental situation (rather than attempting to infer differences in A-State from A-Trait Scores). The experimental evidence reviewed by Taylor (1956) contains various laboratory learning tasks such as investigations of classical conditioning, human maze learning, motor learning, serial verbal learning and paired-associate learning. The findings, by and large have been consistent with the predictions of drive theory.

Two laboratory learning tasks that have been selected for the present study are Serial Verbal Learning (nonsense-syllables) and Verbal Paired-associate Learning (meaningful words). The reasons for the selection of these tasks have been explained in the latter portion of Chapter 3. However, it will suffice here to say that both the tasks were of moderate difficulty.
level. Moderate difficulty has been defined as any task on which low-intelligence subjects rarely fail and high-intelligence subjects rarely attain perfection, or in other words a task that elicits minimum of ceiling and floor effects. As such, no laboratory studies of anxiety and intelligence are available in which the experimental task could be classified as difficult, for most able students. An important purpose behind keeping the difficulty level moderate, in the present study, has been to let every subject perform to a certain extent on the learning task.

Studying effects of anxiety and intelligence on achievement seems to be quite significant. An academic achievement situation constitutes real stress because of the importance assigned to achievement in examination. Task difficulty is assumed to be at a moderate level in an academic situation. In such a situation an important objective is that all students should be able to perform to a certain extent and obtain some scores.

It is certain that intelligence plays an important role in academic achievement and further that stress is inherent in such a situation which induces or arouses anxiety in an individual and more so in those who are already anxiety prone. Anxiety aroused in such a situation may not always be of the facilitative type. Research on anxiety and performance in academic setting must also specify the conditions under which anxiety states are aroused, and take into account the various kinds of stress that are encountered in school environments.
Farber and Spence (1956) have proposed two alternative hypotheses: (1) the "chronic" hypothesis which assumes that high anxiety (HA) subjects manifest higher D (drive) than low anxiety (LA) subjects in all situations, whether stressful or not; and (2) the "emotional reactivity" hypothesis posits that high anxiety subjects react with higher D than low anxiety subjects, only in situations containing some degree of stress. With the experimental evidence so far available the issue remains undecided. The very fact that investigators in drive theory tradition, in order to induce anxiety, have exposed their subjects to some kind of stress indicates that anxiety is, by and large, reactive, thereby favouring the emotional reactivity hypothesis (e.g. Spence & Spence, 1966). According to Spielberger's State-Trait Anxiety Theory although stress is likely to induce higher levels of anxiety in the anxiety-prone, yet the appraisal of stress as threatening depends upon many individual factors. It is quite possible that an otherwise low anxious person so perceives the situation that he becomes equally or even more anxious than an otherwise high anxious individual. It is worthwhile to provide evidence as to whether anxiety in an experimental situation is chronic or reactive, which also implies the use of state-anxiety (A-state) measures.

It is clear that not only stress but also the resulting A-state scores and task variables must be taken into account in determining the effects of trait anxiety on performance.
Ideally, research on anxiety and learning should take into account the nature and amount of stress that is involved in a learning situation, and its differential impact on level of A-State for persons who differ in A-Trait.

Some terminological ambiguities in anxiety research have already been pointed out. It is hoped that progress in anxiety research will be facilitated by the adoption of terminological conventions that permit precise communication among investigators in the description of anxiety as process. It has been suggested that the term stress be used to refer to the real dangers associated with objective stimulus events and that threat be used to refer to the phenomenological experiences of the subject. Further emotional reactions that consist of feelings of tension and apprehension and heightened activity of ANS be labeled as A-States. Very little work on these lines have been done in India. One study that followed Spielberger's model of State and Trait Anxiety (Sharma and Wangu (1976), with trait-state distinctions too has its limitations (recorded somewhere else).

There is a great need for cross-cultural research in general and in specific in anxiety research. A great diversity of theoretical orientations guiding anxiety research exists. In reality, such research has its own advantages. For instance, this can extend the range of exact content of independent variables involved in anxiety beyond that found in American culture and can make anxiety theory more precise by identifying culture in which people seem to behave out of line with the
predictions based on an anxiety model developed from observations in the United States only.

A relatively unique feature of the present study is that A-State has been measured immediately after the completion of each of the two tasks of learning. Further, stage-wise analysis of learning is done separately for A-trait groups and for A-state groups. The proposal to measure A-state during the learning tasks, besides theoretical advantages has mental health relevance as it emphasizes our concern with identifying variables that facilitate and impair the learning that is involved in academic achievement. There is great need, not only in any one culture, but everywhere to help young people achieve academically to the limits of their potential.

Spielberger's extension of Drive theory to encompass individual differences in intelligence and complex learning processes involved in academic achievement are empirically tested. These investigations of relationship between transitory and trait anxiety and learning, in different cultures would help to establish the generality of the findings of a large number of studies done in the U.S.A.