Chapter One

INTRODUCTION

ANXIETY

The present age may be said to be an age of anxiety. Anxiety is an emotional response that contributes to the development of almost all the psychiatric disorders. As such, the concept of anxiety has been of great interest to the psychologists. Anxiety has long been regarded as the fundamental human emotion. It connotes an experience of varying blends of uncertainty, agitation and dread. If the ego is unable to bring the excessive stimulation under control, it becomes flooded with anxiety.

Psychoanalists view anxiety as a signal or alarm indicating some deep-rooted pathology. Sigmund Freud (1936) has contributed a lot to the present understanding of anxiety behaviour. He defined anxiety as "something felt", an unpleasant emotional affective state that is universally experienced. According to him, anxiety is basic to the formation of neurotic symptoms. The conception of the anxious response as a
danger signal is associated with an external danger as well as the unconscious contents and motivations. According to May (1950), anxiety is "the apprehension cued by a threat to some value the individual holds essential to his existence as a personality". In Sullivan's (1953) view, anxiety is a state of tension arising from the experience of disapproval in interpersonal relations.

Behaviourists consider anxiety as a kind of maladaptive response which is manifested behaviourally as well as physiologically and affects individuals' performance in different situations. According to Roubicek (1970), anxiety is a "state involving both somatic and psychological participation aroused by any condition which threatens the integrity of the organism". He conceived it as an extension of irritability and vigilence. Sometimes, an anxiety response acts as a reinforcer, particularly when withdrawal relieves the individual of the tensions produced by the threatening situation.

Izard and Tomkin (1966) have equated anxiety with fear, which they treated as a primary emotion. They considered anxiety as "pattern of emotion" that includes fear as well as other fundamental emotions. Lazarus and Averill (1972) have defined anxiety as "an emotion based on the appraisal of threats, an appraisal that entails symbolic, anticipatory, and other uncertain
elements." They differentiated between anxiety and fear-related emotions such as fright, separation, distress and instrumental fear in terms of the developmental origins of these emotional states, the conditions which elicit that, and the pattern of response by which they are characterized.

Lader (1972) considers anxiety as an emotional response syndrome. According to him, anxiety can be examined in terms of subjective, cognitive, behavioural and physiological dimensions. Epstein (1972) treats anxiety as an acutely unpleasant "state of diffuse arousal following the perception of threat." Thus, for him anxiety is an unpleasant emotional reaction to either real or imagined danger that is accompanied by autonomic discharge and subjectively experienced as tension, fright, or 'nervousness. The state of 'helplessness' is cognitively interpreted as anxiety, which results when a distress-relieving behaviour is not available. It is seen that the interruption of organized plans or sequences of behaviour lead to state of distress and arousal.

Though, the above descriptions indicate toward only the negative effects of anxiety, it performs
an important positive function also: it warns the person of impending danger and gives the signal to the ego to take appropriate measures so that the danger may not increase to the extent to overthrowing the ego. Thus, when anxiety is aroused, it motivates the person to do some thing he may flee from the threatening region, inhibit the dangerous impulse, or obey the voice of conscience. If anxiety cannot be dealt with by effective measures, it becomes traumatic and reduces the person to a state of infantile helplessness. When the ego cannot cope with anxiety by rational methods, it has to fall back upon unrealistic ones.

Spielberger (1970) considers the nature of anxiety as a transitional state which consists of feeling of apprehension and tension and increased autonomic activity. Barkovec (1976) agreeing with Spielberger's conception of anxiety, conceptualizes anxiety as a complex pattern of responses characterized by subjective feeling of apprehension and tension, occurrence of physiological arousal, and behavioural manifestation of arousal.
Types of Anxiety

Cattell (1957) attempted to treat anxiety as a mood state and as a personality trait, and suggested appropriate technical procedures for measuring the states and traits of anxiety.

Long back, Freud (1959) talked about three types of anxiety: reality anxiety, neurotic anxiety, and moral anxiety. According to him, the basic type is 'reality anxiety' or fear of real dangers in the external world. The other two types are derived from the reality anxiety. Neurotic anxiety is the outcome of the fear that the instincts will get out of control and cause the person to do something for which he will be punished. This type of anxiety is not so much fear of the instincts themselves as it is a fear of the punishment that is likely to ensue from instinctual gratification. The third type of anxiety, moral anxiety, is fear of the conscience. The person with a well developed superego feels guilty when he does something, or even thinks of doing something, that is contrary to the moral code under which he has been brought-up. Moral anxiety also has realistic basis in the sense that the person has been punished in the past for violating the moral code and may be punished again.
Some writers have argued that the concept of anxiety may itself be divided into components that are respectively facilitating and debilitating in their effects on learning and performance. Alpert and Haber (1960) devised an Achievement Anxiety Test (AAT) to measure these two different kinds of anxiety as they relate to test-taking situations.

Psychiatrists, psychoanalysts and psychologists label anxiety in different ways. While a psychiatrist labels it as "free floating" or "bound" and "acute" or "chronic", a psychoanalyst would label it as "conscious" or "unconscious" anxiety, and a psychologist prefers to call it as "trait" or "state" anxiety. Various types of anxiety are briefly described below:

(i) Objective vs. Non-objective Anxiety: Some authors have distinguished between objective and non-objective anxiety. Freud (1936) regarded objective (or real) anxiety as synonymous with fear. We have seen earlier that Freud (1959) talked about anxiety caused by a real danger in the external world which is consciously perceived as threatening and the perception of danger evokes an anxiety reaction. Thus, objective anxiety can be treated as conscious anxiety also.
Non-objective is that anxiety for which source of the danger or threat is not known. Threat as such is an internal danger or is from within; this source is not consciously perceived because it has been repressed. Therefore, non-objective anxiety may be called neurotic or unconscious anxiety.

(ii) Situational vs General Anxiety: Anxiety is classed into situational and general categories also. Anxiety that occurs only in specific situations or that involves only a specific response is called situational anxiety.

General anxiety, on the other hand, is a pervading type which influences all the activities of a person rather than being tied or bound to one situation, and hence this type is also referred to as 'free-floating' anxiety in contrast to the 'bound' anxiety.

(iii) Acute vs Chronic Anxiety: Acute anxiety refers to a sudden and intense form of anxiety. It suddenly appears in form of an attack. On the contrary, 'chronic' anxiety is referred to elevated state of anxiety which persists over a long period.

(iv) Active vs Passive Anxiety: Roubicek (1970) distinguishes between active and passive types of anxiety depending on the response, defence or attack,
made by the person. According to him, active anxiety is accompanied by increased muscle tension, tachycardia and acceleration of breathing, and it corresponds to the instinct of defence urging the individual to attack on flight. It may lead to a panic reaction with purposeless psychomotor restlessness. Passive anxiety, on the other hand, is generally accompanied by a temporary cessation of respiration, bradycardia, and sometimes by a transitory paralysis of movement.

(v) State vs Trait Anxiety: A widely accepted classification of anxiety has been made into state and trait anxiety. Through factor analysis, Cattell and Scheier (1958, 1961) extracted two distinct anxiety factors—trait anxiety and state anxiety. They defined trait (or what we have earlier called chronic) anxiety as a relatively permanent or stable characteristic of personality, and state (or transitory or acute) anxiety as a condition which varies from day-to-day or even from moment-to-moment.

The 'trait anxiety' factor was loaded with variables like ego-weakness, guilt-proneness, and tendency to embarrassment, whereas the 'state anxiety' factor was based on a series of variables varying over periods of measurement (thus, indicating a transitory state or condition of the organism) and had
high loading on physiological variables like respiration rate and systolic blood pressure.

According to Spielberger (1966) trait anxiety measures signify anxiety-proneness or individual differences in the likelihood that for certain situations anxiety state will be experienced. He further (1970) discusses the nature of anxiety as a transitional state which consists of feelings of apprehension and tension, and heightened activity of the autonomic nervous system. This he calls "anxiety-state". It is assumed that states vary in intensity and fluctuate over time as a function of the stresses that impinge upon the individual. State anxiety is differentiated from 'anxiety proneness' which is actually the 'trait anxiety'. The latter is defined in terms of individual differences in the frequency that anxiety states are manifested over time. Spielberger (1972) concluded that an anxiety state could be defined by an individual's introspective verbal report that he feels anxious (frightened or apprehensive). Consequently, he conceptualized transitory or state anxiety (A-state) as a complex and unique emotional condition or reaction consisting of unpleasant, consciously-perceived feelings of tension and apprehension, with associated activation or arousal of the autonomic nervous system.
The above discussions reveal that state anxiety is concerned with the individual's anxious feelings at a point in time, whereas trait anxiety refers to the habitual tendency of the persons to become anxious. In other words, the former is a mental state whereas the latter is the personality variable. When reference is made to an anxious person, it indicates to the proneness or predisposition to anxiety in the person who, in different stimulus situations, would behave in anxious manner. This has been referred to as trait anxiety. Thus, trait anxiety is what is manifested in different situations. Taking this very fact into account, Taylor (1953) devised his famous Manifest Anxiety Scale to measure this trait anxiety. Afterwards, numerous attempts have been made to assess and study the various aspects of anxiety.

Anxiety and School Performance

Study of anxiety behaviour has assumed a special importance in psychology in general and in educational psychology in particular in light of the findings that anxiety itself affects learning, performance and achievement. Many investigators have found anxiety to be related to the learning and
achievement. For example, Hawkes and Furst (1971) and Kanekar (1977) reported negative correlation between anxiety and achievement. Sobel (1976) also studied the relationship between academic attainment and anxiety. Dodds (1976) has studied the correlations between children's anxiety and their school achievement. Winsor (1974) has studied the reading achievement of 4th grade children under anxiety-arousing situation. Joesting and Whitehead (1977) studied this relationship in a different way. They required their 101 undergraduate students in an educational psychology course to write their own examination items. The best and worst of these items were used to compose two forms of a classroom-test. Then these subjects were administered the State-Trait-Anxiety Inventory before and after taking both forms of this test. It was noted that the subjects tended to score higher on the good items ($p < .05$), and the more state anxious subjects tended to have lower course grades. Longfeldt-Nagel, (1977) found that anxiety in the sense of self-criticism and self-control had no effect on learning success, while anxiety in the sense of ego-weakness and feeling of being menaced by the environment affected the learning in anxiety-evoking situations. King, Heinrich, Stephenson and Spielberger (1976) examined a theoretical model which posits that trait anxiety influences
state anxiety and the latter, in turn, influences achievement. Their findings suggested that trait anxiety has a direct influence on achievement. Rao (1974), taking anxiety scores as the measure of adjustment, tested the hypothesis that academic achievement is related to adjustment to the academic work. From half of the male under-graduates of six colleges, two groups of overachievers and underachievers were selected and were administered the Academic Anxiety Test (AAT). Results show that the groups differed significantly in their adjustment to the academic situation as evidenced by their anxiety scores. The underachievers were adversely affected by the presence of the debilitating type of anxiety whereas the overachievers were assisted in their adjustment by the facilitating type of anxiety.

Sunita Sharma (1985) attempted to examine whether high and low achievers differ on anxiety scores, while the effect of verbal intelligence was controlled. For this purpose she selected 53 high and 53 low achievers on the percentile basis. The results of 't' test and analysis of covariance indicate that the high achievers possess significantly lower level of anxiety than the low achievers. She concludes that anxiety plays a dominant role in high
and low achievement of the students of science stream at higher secondary level when the effect of verbal intelligence has been eliminated.

A number of investigators have attempted to study the relationship between general or manifest anxiety and test or examination anxiety. As such, a somewhat more detailed discussion of test-anxiety and related issues would help in understanding the phenomenon in depth. First we will discuss the concept of test-anxiety. Subsequently, a brief account of the major variables and some studies throwing light on their relationship with test-anxiety will be presented.

**TEST-ANXIETY**

A special type of anxiety is aroused in testing and examination situations which many a times affects performance and achievement. This type of anxiety has been named as Test-Anxiety. Manifest and test-anxieties have been found to be highly correlated (Reiter, 1971).

Sarason (1961) has defined test-anxiety as a kind of anxiety which prevents people from doing well in stress situations. He provided evidence to the effect that high test-anxious individuals are
affected by personal threat. Hill and Wigfield (1984) emphasize upon the impact of test-anxiety in situations in which evaluative pressure leads some students to become excessively preoccupied with the possibility of failure and concerned about possible negative reactions of adult evaluations. A number of writers have viewed test-anxiety as a proneness to emit self-centred, interfering responses when confronted with evaluative conditions (Mandler and Sarason, 1952; Sarason 1960). This is an R-S interpretation which emphasizes two important components of test-anxiety: one is autonomic reactivity such as sweating, accelerated heart-rate, and so on; the other is expressed in such utterances as 'I am most dull', 'May be I fail', etc. which might be interfering with the actual task. Liebert and Morris (1967) call the former as the "emotionality" and the latter as the "worry" component of test-anxiety. Results obtained from a series of studies (Liebert and Morris, 1967; Spiegler, Morris and Liebert 1968; Doctor and Altman, 1969; Morris and Liebert, 1969; 1970) suggest that scores on the two components vary predictably with temporal relationships to classroom relationships and with performance expectancies. A test of test-anxiety was administered
several days before an examination, immediately before and immediately after. Scores on "worry" aspect tended to be fairly constant across time, while "emotionality" scores reached a peak immediately before an examination, falling off rapidly immediately after the examination. Also, 'worry' scores were significantly and negatively correlated with subject's pre-examination rating of performance expectancy, while 'emotionality' scores were not related to performance expectancy.

Tobias, Hedl and Towle (1974) conducted a study to test the hypothesis that high test-anxiety students would perform more poorly on difficult material because they divide their attention between personally relevant and task-relevant concerns more than low test-anxiety individuals. It was reasoned that such division of attention requires more time for high-anxious students on difficult items which leads to longer response latencies. Sarason's Test Anxiety Scale, the State-Trait Anxiety Inventory, and a Mathematics Test containing 60 easy and difficult items were administered to 78 undergraduates. Results indicated that high anxious subjects performed more poorly on the difficult items than low anxious subjects. High anxious subjects had higher levels of state anxiety during testing than the low-anxious subjects.
The latency analysis, however, failed to confirm the hypothesis.

These findings further suggested that the adverse effects of test-anxiety are due to attention being divided between self and the task. It may be recalled that the worry component is concerned with "pre-occupation with performance (Doctor and Altman, 1969), as well as the "cognitive concern about the consequences of failing the ability of others relative to one's own, etc." (Liebert and Morris, 1967).

I.G. Sarason (1958) constructed a Test-Anxiety Scale (TAS) consisting of 21 items. This scale is based largely on items taken from Mandler and S.B. Sarason's (1952) Test Anxiety Questionnaire (TAQ) modified in form of true-false questions. The TAQ and TAS are highly correlated. On the basis of his findings, I.G. Sarason has restated the interfering response hypothesis emphasizing that it is a habit interference on anxiety. According to him, the subjects scoring high and low in anxiety differ in the response tendencies activated by personally threatening conditions. Low scoring subjects may react to such conditions with increased effort and attention to the task at hand, whereas the high scoring subjects respond to threat with self-oriented,
personalized responses. As Sarason (1958) states, the attentional foci of high and low anxious subjects are quite different under threat conditions. The low-anxious subjects turn their attention to the task, while high-anxious subjects attend to their internal self-oriented responses.

I. Sarason (1960) has reviewed a number of studies that provide evidence to the effect that the high-anxious subjects have the characteristics of being more self-deprecatory, more self-pre-occupied, and generally less content with themselves than the low anxious subjects. He noted that, in general, these investigations indicated that persons who score high on anxiety scales describe themselves in negative self-devaluing terms on other pencil-and-paper measures as well. Some of the studies have reported relationship between test-anxiety and responses of subjects in experimental situations. In one study by Doris and S. Sarason (1955), subjects differing in test-anxiety scores were arbitrarily failed on a number of tasks. Following the tasks, the subjects were required to rank "blame-statement", which included "self-blame" and "other-than self-blame" items. The results indicated that highly anxious subjects blamed themselves for their failures significantly more than did the low anxious subjects.
Alpert and Haber (1960) constructed a test anxiety questionnaire which they called Achievement Anxiety Test (AAT). This test yields two measures, one is a debilitating anxiety scale and the other measures facilitating anxiety. Mandler and S.B. Sarason (1952) had theorized that test-anxiety is debilitating of performance only among subjects who had learned a habitual class of interfering responses to the test-anxiety. Among persons without this class of interfering responses, test-anxiety elicits task-relevant responses leading to task competition. Persons scoring low on the TAQ were implicitly assumed by Mandler and Sarason to be high in the facilitating kind of anxiety.

Whelen (1969) and Sarason (1972) have found that if preliminary instructions were of evaluative or achievement-orienting nature, the high test-anxious subjects tended to perform at a low level as against a control group of subjects. On the other hand, the same evaluative or achievement-orientation exerts a salutary effect on the low test-anxious subjects as against the control subjects. Achievement-orienting conditions may help the low test-anxious individual to focus more intensively on the task before him. If one tries to reassure him by emphasizing the non-evaluative nature of the performance situation, it
gives detrimental or debilitating consequences. The motivational level of the low test-anxiety subject shows a spurt when he has reason to believe that a strong effort is needed or expected, but it would wane when he is suggested that his level of performance is not of any interest or importance.

The high test-anxious person also tends to be self-oriented and he personalizes the situations and challenges confronting him. On the other hand, the low test-anxious individual plunges inword; he either neglects or misinterprets informational cues that may be readily available to him or experiences attentional blocks. Ganzer (1968) opined that the test-anxious person is more self-preoccupied and self-deprecatory than his low test-anxious counterpart, and that these self-focused tendencies are activated by the pressures of the testing situation.

Wine (1971) points out that a great number of researches on test-anxiety have focused on the cues to which high test-anxious individual responds with personalized, task-irrelevant, interfering responses. Because of this preoccupation with variables and conditions that deleteriously influence the highly anxious individual, not much emphasis has been laid on the side of attentional processes.
Clyne (1972) has attempted to expand the concept of test anxiety, originally set forth to describe a specific condition in children, to include anxiety in persons of any age who are confronted with times of crises in interpersonal relationships and in the process of emotional maturation. Anxiety based on conflict or ambivalence finds expression when repressive defenses break down.

Heinerth (1972) employed four different methods of measuring anxiety. These were a 50-item questionnaire to assess anxiety during the preparation period for the examination, a 24-item questionnaire just before taking the examination, a self-rating of anxiety on a 9-point scale, and determination of the semantic differential related to subjects' attitude toward the examination. Data from 105 female students on these four tests were subjected to factor analysis. The results showed that a considerable proportion of subjects reacted with neurotic symptoms. More significant was the finding that the emotional stress connected with examinations had a detrimental effect on performance.

As the name implies, the main effect of test-anxiety is seen on the performance in examinations or tests. But this test-anxiety itself seems to be affected by a number of factors. Several studies have provided
evidences to this effect. First, we shall review some studies which demonstrated the role of test-anxiety in performance. Then we shall review some studies conducted to ascertain the effect of certain independent variables on test-anxiety.

TEST-ANXIETY AND PERFORMANCE

Much research on test-anxiety has been directed toward its correlation with performance on different types of tasks. If a student appears, for example, in an examination with too high an anxiety, he may fail to understand the questions properly and may even forget the whole thing. Therefore, only moderate anxiety stimulates the most effective learning. Con (1960) studied fifth-grade boys divided into high, middle and low anxiety groups. The academic performance of the middle anxiety group was significantly better than those of the other two groups, the poorest being that of the high anxiety boys. Test-anxiety exerts its influence on performance via several factors. In a study, Sarason (1961) asked his college subjects to make serial learning of disyllable words having low meaningfulness so as to make the task difficult. Prior to the experiment the subjects had been administered the Test-Anxiety Scale and the General Anxiety
Scale (Sarason, 1958). Half of the subjects performed under neutral conditions as they simply were given the instructions necessary to respond to the task at hand. The remaining subjects, in addition to these instructions, were told that the task was an intelligence test, and that performance on it would indicate their level of ability; and, therefore, they should perform at as high a level as possible. The results indicate that for the final block of five trials on which the subjects performed under the neutral or controlled condition, the two test-anxiety groups did not differ significantly. Under the achievement-orienting or evaluational conditions the high test-anxiety subjects were found to be inferior in performance to the low test-anxiety subjects. This suggested that the difference in performance of the "high test-anxious and neutral" and the "high test-anxiety but achievement-oriented" groups is not due to the factor of intelligence but rather to differences between the experimental and control instructions. Other studies have also substantiated this finding. When the results of this experiment were analyzed in terms of general anxiety scores, no significant differences were obtained. The evidence suggests that the overlap between test-anxiety and general anxiety is not sufficient to make the two concepts synonymous (Sarason, 1960). They are positively correlated, but the degree of correlation does not reach the level of a reliability coefficient.
Task complexity is another factor which has been found to affect test-anxiety (Sarason, 1960; Ruebush, 1963). It has been found that the performance of low test-anxiety subjects on complex tests is better under achievement-orienting than under neutral condition.

It has been observed that while performing on a task, the highly test-anxious person divides his attention between self-relevant and task-relevant variables, whereas the low test-anxiety person focuses his whole attention on the task. This interpretation seems to be very reasonable. It has been seen that highly anxious persons are generally more self-preoccupied than are those who are low in anxiety. The self-focusing tendency of high test-anxious persons is activated in testing situation; greatest performance differences occur because of the self-focusing tendencies of high test-anxious subjects and the task-focusing tendencies of low anxious subjects; anxiety tends to reduce the range of task cues utilized in performance; "worry" as cognitive activity is more debilitating of task performance than is automatic arousal.

A striking feature of highly test-anxious persons is that they typically perform more poorly
on tests than do the low test-anxious persons. This so happens more definitely when the tests are administered under conditions of stress and evaluation. This difference in performance is largely because of a difference in the attentional focuses of high and low test-anxious persons during task performance. As has been stated above, while performing a task, the low test-anxious person focuses on task-relevant variables and the high test-anxious subject is internally focused on self-evaluative, self-deprecatory thinking and perception of his autonomic responses. Since the difficult tasks require full attention for adequate performance, the high test-anxious person cannot perform adequately due to division of his attention between internal cues and task cues.

Sarason (1975) has further established that female undergraduates (N = 200) with low test-anxiety performed better than those with high test-anxiety on a learning task. Scherr (1976) has also studied the role of test-anxiety in discrimination learning among children. Thompson (1977) made a thorough study of relationship of various types of anxiety (including trait, state, and test) to reading performance.
According to Marlett and Watson (1968) the high test-anxious person spends some of his task time in doing those things which are not task-oriented. He worries about his performance as well as about how well others might do. Not only this, even he ruminates over the available choices and is often repetitive in his attempts to solve the task. In order to overcome the self-defeating kind of behaviour shown by the high-anxious person one has to allow him to perform without the stresses and constraints which maximize the negative effects of the avoidance behaviour.

Even more direct evidence for the activation of self-oriented tendencies among high-anxious subjects in test situations is provided in the study reported by Ganzer (1968). The effects of audience presence and test-anxiety on the serial verbal learning of female subjects were investigated. He noted that high Test-Anxiety Scores, especially in the observed condition, emitted more task-irrelevant comments than any other group. Content analysis revealed that the comments were mostly of a self-evaluative or apologetic nature.

Hall and Hinkle (1972) noted that because of anxiety associated with tests the students become
unable to perform in testing situations and fail in university environment.

Gjesme (1972) examined the relationship between test-anxiety and school performance in the light of achievement-motivation theory. One of the main findings was that girls of high ability had their test-anxiety strongly aroused, while moderate and low ability girls did not show their test-anxiety much aroused.

Morris and Perez (1972) assigned 78 undergraduates to high and low test-anxiety groups on the basis of scores on the Test-Anxiety Questionnaire. Then the subjects completed the Davis Reading Test under nonstressful conditions. Group I (irrelevant interruption) was interrupted by trivial irritating occurrences; Group II (relevant interruption) was interrupted by occurrences which appeared to be part of the planned sequence of the experiment; Group III (control) was uninterrupted. Of the four situational measures of affect utilized (hostility, anxiety, worry and emotionality), 'hostility' measure was significantly aroused by the experimental manipulations and this elevation occurred only for Group I (irrelevant interruption group). All indices of emotional arousal tended to be higher for the high than for the low
test-anxious subjects. However, there were no significant interaction effects between anxiety levels and treatment groups. Further, performance was negatively related to worry and anxiety but was not affected by experimental treatments.

Berkley and Sproule (1973) noted that test-anxious and unsophisticated individuals do not perform up to their capacity on tests of aptitude and short-term-memory (as well as intelligence and achievement).

Szetela (1973) presented a mathematics lesson under success-failure treatment to 309 8th graders grouped by three levels of test-anxiety. Data for 192 subjects showed that the effects of success-failure on measures of mathematics performance and mathematics-test-anxiety were not significant. Analysis of covariance with intelligence as a covariate indicated that Test-Anxiety was a marginally significant factor in mathematics learning. Mathematics-Test-Anxiety was highly related to Test-Anxiety, and girls exhibited significantly higher Mathematics-Test-Anxiety than boys. When Mathematics-Test-Anxiety was treated as a quadratic function of test-anxiety levels, there was a significant sex and test-anxiety interaction due to the tendency of girls to be significantly more test anxious than boys at the high test-anxiety level.
In a study by Frederiksen and Evans (1974) test-anxiety was not found to be significantly associated with performance. Wattmaier (1974) put 300 undergraduates to an examination condition under two levels of anxiety to assess relationships among trait-anxiety (as measured by Alpert and Haber's Achievement Anxiety Test), state-anxiety and activation (measured by the Nowlis Adjective Check list of mood), and performance. Results indicated (a) a positive relationship between trait-anxiety and state-anxiety, (b) a negative relationship between trait-anxiety and activation, (c) a relationship between trait-anxiety and performance only in the more anxious of two examination conditions, and (d) a relationship between activation and performance. It was also noted that the relationships were more pronounced for male subjects.

Vagt and Kuhn (1976) studied the relationship between anxiety and performance taking into account the preparation time at home for tasks. Results show that the performance of anxious pupils is not poorer than that of the nonanxious pupils as former had spent considerably more time preparing assignments. The findings implied that anxious pupils compensate in this manner for their disadvantages in stress situations.
Bond (1977) analyzed the academic test performance of 110 female undergraduates by test-day-anxiety, nontest-day-anxiety, and change in anxiety from a nontest-day. The Today Form of the Multiple Affect Adjective Check List was administered on a non-test-day and immediately prior to a test. Neither test-day-anxiety nor nontest-day-anxiety showed statistically reliable main effects in the analysis of test performance, though the interaction of the two was significant. Analysis of change in anxiety scores revealed that subjects who exhibited a high increase in anxiety on the test day performed more poorly on the test than subjects who had either a low increase or a high decrease in anxiety. Data support the view that an increase in anxiety exerts an interfering effect on test performance.

Geen (1977) has studied the problem in a different way. Eighty female subjects performed a task either alone or in the presence of an observer. The observer either witnessed subject's performance passively or explicitly evaluated the performance. Half of the observed subjects were told that the evaluation was merely to provide help for a future task. Subjects high in test-anxiety showed better performance and less palmer sweat during the period of the task when evaluation was said to be prelude to help than when it was not. Results support the
hypothesis that evaluation apprehension induced by observers is due to anticipation of negative outcomes (i.e., anxiety) and does not follow anticipation of positive outcomes.

Oner (1977) studied 160 high and low test-anxious sixth grade children. One of his hypotheses was that high anxious subjects would learn and perform better under feedback and supportive conditions. The task was learning decimals from a programmed mathematics book. The results showed that low anxious subjects performed better than the high anxious subjects.

Novak (1973), Snyder and Katahn (1973), Rosenzwing (1974), Hellmann (1976), and many others have also tried to study the nature of relationship between test-anxiety and performance on various types of tasks. One aspect of a study by Culler and Holahan (1980) was to ascertain the relationship between test-anxiety and academic performance in college students. Undergraduate subjects were 65 high and 31 low scorers on the Test-Anxiety Scale. Results demonstrate a significant decrement in grade point average associated with test-anxiety. Also, the high test-anxious subjects were found to have poorer study skills. For high test-anxious subjects quality of study habits and amount of
study time were positively related to academic performance, whereas missing classes and delaying examinations were inversely related to performance. These findings indicate towards the interfering effect of test-anxiety.

Kim (1981) attempted to investigate the organizational cue deficit as a function of test-anxiety level in 50 undergraduates. High, medium and low test-anxiety groups were formed based on subjects' responses on a test-anxiety scale. Subjects were required to study phrases from the main test book of the course for minutes. A cued or experimental group received 9 names of chunks to help them remember the phrases, whereas the uncued control group did not. Subjects completed an immediate recall test and then a delayed recall test following 30 minutes of a normal class session. Thus, this study was conducted employing a 3 X 2 X 2 (anxiety X cue X testing mode) factorial design. Results show that high-anxious subjects could recall less on both immediate and delayed recall tests and benefited more on delayed recall tests from having retrieval cues than did low-anxious subjects. Kim suggests that high anxiety is debilitating as it induces a deficit in selective strategies and flexible utilization of organizational cues to incorporate
individual materials into higher order conceptual structures.

Lukesch and Helmke (1984) collected retrospective test-anxiety ratings from 6th and 9th graders on 11 situations before and during a written examination. Their results indicate a continuous increase of anxiety ratings that began with the announcement of the examination and lasted until shortly before the actual beginning of the test, followed by a stepwise decline until the end of the examination.

Dew, Galassi and Galassi (1984) investigated the relation of mathematics anxiety to situationally assessed test-anxiety, mathematics performance, physiological arousal and mathematics avoidance behaviour in 23 male and 40 female undergraduates. Subjects were required to complete the Mathematics Anxiety Rating Scale, the Mathematics Anxiety Scale, the Anxiety Toward Mathematics Scale, and the Test-Anxiety Inventory prior to completing three mathematics tests. During the tests, heart rate, skin conductance level, skin fluctuations, and avoidance behaviour were monitored. Subjects also completed the Post-Task Questionnaire, a situational measure of test-anxiety, worry, and emotionality. Results indicate that various measures
of mathematics anxiety were more highly related to each other than to test-anxiety. Mathematics anxiety accounted for 14 to 23% of the variance in 2 tasks, whereas ability accounted for 30 to 42%. It was also found that anxiety rarely added to the variance accounted for by ability.

Klinger (1984) evaluated cognitive-interference, reassertion, and reaction-to-performance models of test-anxiety. For this purpose 82 university students were asked to complete the Test-Anxiety-Scale. Their state anxiety just before and after a course examination was also measured. In addition, the subjects were required to describe their preparation for the test and report thought content and state anxiety up to 6 times during the test. Test-Anxiety Scale scores were predictive of pre- and post-test state anxiety but not performance or problem-solving thought frequency during the test. Thought content was significantly but weakly correlated with performance, which was well correlated with post-test state anxiety but not with pre-test anxiety. Pre-test state anxiety was virtually uncorrelated with post-test state anxiety, with the correlations gradually declining during the test. Question-answering thought content correlated inversely with anxiety during the test. Anxiety did not facilitate performance in any of
the groups. Preparation correlated only with performance. In this way, we see that the results are not consistent with a cognitive-interference interpretation of test-anxiety. Rather, they suggest that anxiety is more clearly an effect than a cause of poor performance.

Van der Ploeg and Hulshof (1984) administered a Dutch adoption of the Test-Anxiety Inventory to 154 subjects aged about 12 years and studying in the 1st and 2nd year of secondary school. Their results show that debilitating effects of high test-anxiety (especially of the worry component on performance) were nested among subjects in the upper range of intelligence (as measured by elementary school performance). Best performers were the low-anxious and high-intelligence subjects. Worst performers were high-anxious and lower-intelligence subjects. However, on the whole subjects with lower intelligence achieved less and were less influenced by the impairing effects of test-anxiety. The results of this study suggest that the test-anxious students can be helped to develop coping strategies to overcome stress of examination.

Yates, Hannell and Lippett (1985) examined the predictive value of two instruments as indicators of psychological vulnerability in a stress-inducing, formal testing situation. The Advanced Progressive Matrices
was administered to 72 Australian female undergraduates in two sessions one week apart. Session 1 was categorized as a practice test. Following Sessions 1 and 2, subjects were administered the Cognitive Failure Questionnaire (CFQ), the Test-Anxiety Scale (TAS), and a measure of cognitive interference. Findings show that the CFQ predicted levels of cognitive interference and mind-wandering during Session 2. The TAS predicted cognitive interference as well as actual test performance in Session 2. The authors suggest that the CFQ and TAS predict different aspects of the manner in which individuals react in stressful testing situations.

Ford, Pelham and Ross (1985) investigated selective attention in 46 high-test-anxious and 47 low-test-anxious 2nd, 4th, and 6th graders. They examined the possibility that performance deficits in high test-anxious children resulted from attention to task-irrelevant information may have resulted from an association between test anxiety and poor reading ability, with reading ability rather than test anxiety being the variable associated with selective attention difficulties. Subjects were given the Test-Anxiety Scale for children and the Defensiveness Scale for children. Three measures of selective attention were employed: Visual and auditory incidental learning tasks and a speeded classification task. No evidence was found for selective
attention deficits in high-test-anxious subjects. There was a marginal tendency for older poor readers to be more likely than normal readers to be high in test-anxiety.

CORRELATES OF TEST-ANXIETY

Quite a few factors have been identified which determine the degree of test-anxiety in an individual. These are briefly discussed in the rest of this chapter.

1. MANIFEST (OR GENERAL) ANXIETY AND TEST-ANXIETY

We have already mentioned that several investigators have reported close relationship between manifest anxiety and test-anxiety. For example, Watson (1967) gathered data from a large sample (N=648) to determine relationship between locus of control, manifest anxiety, and test-anxiety. Data yielded significant correlations among these three variables. Reiter (1971) studied relationship between manifest anxiety and test-anxiety. Alongwith two other tests, he administered a Manifest Anxiety Scale and Sarason Test-Anxiety Questionnaire to 76 male and female undergraduates. Correlations between the two test-scores were significant.

Auerbach and Spielberger (1972) reviewed the literature on the assessment of anxiety with the Rorschach
in terms of Spielberger's conception of anxiety as a relatively stable personality disposition (A-Trait) and as a transitory emotional state (A-State). One of their findings was that Elizur's Rorschach Content Test-Anxiety Scale was more closely related to A-Trait than to A-State.

Stellwagen (1972) has also studied test-anxiety, general anxiety and grading procedures in some college level physical science for non-science classes. Jones (1973) tried to determine the relationship among self-esteem, general anxiety and test-anxiety in Black and White school children studying in classes 4th to 6th. Gubbey (1978) too studied the relationship between self-esteem, general anxiety, and test-anxiety among Figian School Children studying in 6th to 10th grades and Mexican-School children in 3rd to 8th grades in schools in their own countries.

Christmann (1978) attempted to find out the relationship between test-anxiety and 16 variables of personality, school grades and parental education style of 159 seventh grade boys and girls. One aspect of his findings was that in case of both the males and females, the test-anxiety was found to be significantly correlated with manifest anxiety (r=.58).
A study by Betz (1978) indirectly throws light on the relationship between test-anxiety and trait anxiety. He studied the factors related to prevalence and intensity of math-anxiety in 652 students from two mathematics courses and a psychology course. Results indicate that math-anxiety occurs frequently among college students. Further, the test-anxiety is more likely to occur among girl students than among the boys. Higher levels of math-anxiety were related to lower scores on mathematics test, higher levels of test-anxiety, and higher levels of trait anxiety.

2. LOCUS OF CONTROL AND TEST-ANXIETY

Locus of control is a personality factor which represents a wide range of individual differences. This construct is based on a belief dimension related to measuring the extent to which an individual believes that he is self-motivated, self-directed or self-controlled, or, on the contrary, the extent to which he believes that the environment plays a dominant role in influencing his behaviour and the rewards and punishments which he obtains. Rotter (1966) defined 'locus of control' as a generalized expectancy concerning the relationship between behaviour and outcome. Interpretation of event as contingent upon one's own actions reflects an internal
locus of control and those perceived as independent of one's behaviour determined by fate, luck or powerful others reflects a belief in external locus of control. In this way, locus of control has been regarded as a personality variable.

Some early field and laboratory evidences (Seeman and Evans, 1962; Seeman, 1963; Devis and Phares, 1967; Ducette and Walk, 1973; Lefcourt and Wine, 1969) indicated that the Internal-External dimension encompassed particular cognitive process. Specially, internals more actively seek and acquire control-relevant information than do the externals.

Several authors (e.g., Lefcourt et al, 1975) have confirmed the prediction that individuals would attribute responsibility for success and failure outcomes in a manner consistent with their locus of control orientation. Thus, internally oriented individuals would attribute responsibility for success and failure to causal factors such as ability or effort whereas externally oriented individuals would attribute responsibility for success and failure to external factors such as luck or task characteristics. In other words, internals with their greater sense of personal efficacy or ability to accept the responsibility for success more readily but reject responsibility for failure. Gilmore and Minton
(1974) found that internally oriented individuals were internal in their attribution to failure. Many other researchers failed to find such a differential attribution for success-failure outcomes among internal and external subjects. For example, Lefcourt et al. (1975) found internals attributing both success and failure to ability whereas externals attributing it to luck.

The internal-external dimension has been regarded as a continuum. For example, Rotter (1966) hesitates in accepting it in typological framework. According to Lefcourt (1972), internal control refers to the perception of positive and/or negative events as being a consequence of one’s own actions and thereby under personal control. On the other hand, external control refers to the perception of positive or negative events as being unrelated to one’s own behaviour in certain situation and thereby beyond personal control.

The construct I-E locus of control has been found to be related to a number of other behavioural constructs such as need for achievement, striving for superiority, competence, personal causation or locus of causation, and anomie (Valecha et al, 1980). Several studies have established that locus of control is related with test-anxiety also.
As regards the relationship between locus of control and test-anxiety, it apparently appears that internals should have less anxiety for testing or examination as compared to those having external locus of control. As regards the general or manifest anxiety, Donovan et al. (1975) found their external subjects more anxious than the internals. Himle and Barey (1975), Wennerholm and Zarle (1976), and Patton and Freitag (1977) also reported similar findings. We may examine a few studies which throw light on the nature of relationship between I-E locus of control and test-anxiety.

In some earlier studies, Sarason and Ganzer (1962, 1963) and Sarason and Koening (1965) demonstrated that highly test-anxious subjects generally describe themselves in more negative terms than do the low test-anxious subjects.

Watson (1967) conducted a study to determine relationship among locus of control, manifest anxiety and test-anxiety. Data from a large sample (N=648) yielded significant correlations among the three variables. Gold (1968) conducted a study on Ist year students to examine the relationship between internal-external locus of control and test-anxiety. All the coefficients of correlation were insignificant except for those involving social desirability and intelligence. Casey (1969)
also attempted to verify the relationship between anxiety and perceived locus of control in risky and conservative decision-making situations.

Hountres and Schart (1970) administered Taylor's Manifest Anxiety Scale on 60 low achieving male college students. One third of the subjects were externals, one third internals and the remaining were called internal-external. Analyses of data through t-test revealed that externals had definitely high anxiety as compared to internals. However, internal-externals did not differ from either externals or internals.

Weiner and Potepan (1970) assessed test-anxiety, achievement orientation, and intellectual achievement aspect of internal-external locus of control among 107 undergraduates who had either failed or performed excellently on a mid-term examination. The affect which they associated with the final examination was reported at various times following the mid-term feed-back. Data revealed that there was marked difference in I-E personality dimension of the succeeding and failing male groups. Correlational analysis also yielded systematic relationships between the individual difference variables.

Powell and Vega (1972) administered several tests on 28 black and 15 white female teachers and teacher-aids. Correlation coefficients supported the hypothesis
that locus of control scores are related with anxiety. Prociuk and Breen (1973) administered Rotter's Internal-External Control Scale, the Alpert-Haber Achievement-Anxiety Test, and an Academic Internal-External Control Scale to 87 undergraduates. The results show that subjects experiencing facilitating test-anxiety obtained significantly higher grade point averages than those experiencing debilitating test-anxiety. However, the hypothesis that internals are academically more successful than the externals did not hold good.

Weiner and Samual (1975) assigned 33 male and 45 female undergraduates to three groups which received either a white pill (pill-attribution condition), a pink pill (pill-no attribution condition), or no pill (control). Subjects then completed a test-anxiety measure, were told the "effects" of the two types of pills, completed checklists about the "effects" they might be feeling, and completed an anagram task and two other filler tests. Experimenters' two hypotheses were: (a) among the high test-anxious subjects those who attribute internal arousal to a pill (actually a placebo) will be less anxious and able to perform better on an anagram task than those who attribute their symptoms to the threatening test, and (b) low test-anxious subjects should have their performance only slightly, if at all,
affected by the attribution of arousal to a placebo, since their arousal level might not be sufficient for relabeling to occur. The hypotheses were supported somewhat by the anagram data.

In a recent study Betts (1982) reported that internal locus of control was negatively related to 'competitive anxiety' and positively related to the external scales.

3. EMOTIONAL MATURITY AND TEST-ANXIETY

The term 'maturation' refers to the development of inherent capacities. Emotional maturity, as adjustment, can be regarded as psychological or mental health. For example, the state or degree of happiness shown by an individual is related to his level of adjustment to his environment. If he is chronically unhappy without appropriate cause, it may be due to a depressive illness. According to McGeoch (1942), maturation is any change with age in the conditions of learning which depends primarily upon organic growth factors and not upon prior experience. It implies that "maturation" is the growth process during which a structure or a function is more and more becoming adult or "mature". However, development in traits peculiar to the individual such as fear of
dark or lightning or of a particular object, proceeds primarily because of learning from experience.

Olson (1959) uses the term "maturation" to cover the anatomical, physiological and chemical changes of the body which occur with time and over which we have only slight control. These changes push the child toward adulthood. He says that all of these "in-built" forces that effect such changes fail unless there is an appropriate environment. He uses the term "development" to denote the complex product of maturation (nature's design) and nurture needs and requirements for growth. However, maturation demands nature for development while development works with maturation to produce succeeding steps in development which, in turn, makes greater demands upon environment.

Thus, the organism achieves maturity bodily, mentally, emotionally, socially and in all other respects. As regards emotional maturity, it implies matured reactions to various emotion-producing situations. In fact, there are a number of emotions in the man (even in animals) which start at an appropriate time in life. For example, child is born capable of showing only undifferentiated excitement which is differentiated into delight (positive) and distress (negative) at the age of about 3 months. By six months the distress
develops into the emotions of fear, disgust and anger, but delight differentiates itself into elation and affection only when the child reaches the age of 12 months. By the age of 18 months, the child is able to show affection for other children, but around this age jealousy also develops. The last emotional feeling to differentiate itself is joy which is noticed at the age of about 24 months. Thus, by the end of the second year the child is fully equipped with various emotions and feelings and is ready for the further growth during the pre-school period.

During infancy and early childhood, emotions tend to be heightened and to lack control. The angry child indulges in a sort of random, diffuse and meaningless behaviours. Emotions at this age are brief and transitory. Although, early in life such emotional outbursts are tolerated, the adults disapprove such behaviours in the child. As he grows up, the child learns that his parents are not pleased with his indulgence in emotional outbursts. Outside the home he learns that he cannot express his emotions freely; he learns to control his fear, anger, jealousy, joy etc; he learns that free expression of emotions is looked upon at home and outside as "childish". The attitudes of important persons in the child's life motivate him to control his
emotions. Gradually he comes to understand which form of hostile expression is tolerated by others and which form attract social disapproval or will lead to punishment. In this way, the child gains emotional maturity. Imitation as well as direct teaching also make the child mend his emotional behaviour.

The child must learn not only to control his responses in a constructive way, but he must also learn how to handle the stimuli and the situation that gave rise to emotional behaviour in him. This is possible when he makes changes in his self-concept. This helps in attaining emotional maturity. Emotional immaturity may make the child moody, gloomy and sullen, and to perform below his capacity.

There does not seem to be any study dealing directly with the relationship between emotional maturity and test-anxiety. Most of the studies touching emotional behaviour are concerned with the relation of emotional arousal with test-anxiety (Speigler, Morris and Liebert, 1968; Morris and Perez, 1972; Bishop, 1973; Koening, 1973; Deffenbacher, 1976; and Cooley, 1977).
4. LEVEL OF ASPIRATION AND TEST-ANXIETY

There are several ways in which people consciously direct their behaviour and strive to perform certain types of activity and attain certain ends. In doing so, they attempt to reach some criterion of excellence and set the standard they hope to attain or their "level of aspiration". The act of setting such a level of aspiration many a times motivates the individual to try his best.

The concept of level of aspiration was first introduced by Hoppe (1930) in reference to the degree of difficulty of the goal towards which a person is striving. Hoppe (1930) investigated the various factors which influence goal-setting behaviour. According to Hoppe, individuals are not alike in regard to their level of aspiration. For example, some individuals always have a high level of aspiration whereas others have a low level of aspiration. It is equally true that some individuals are unable to determine their level of aspiration whether high or low whereas other persons are realist in this respect who determine their level of aspiration on the basis of past experience.

Goal-setting behaviour has been studied in experiments on the level of aspiration. Whatever the
individual sets as his momentary goal, may be taken as the measure of level of aspiration. In general, the individual expects to succeed; but in case he sets a very high goal he might fail. It is seen that he is not satisfied with the low goals where he always succeeds. The studies of level of aspiration suggest that it is a cognitive type of motivation in that the individual becomes involved in the task, estimates his own level of achievement, and he experiences success or failure, and, thus, sets his own goal.

Lewin (1935) developed a technique to measure factors involved in the level of aspiration by which the person is asked to expect what his performance will be on the same task on the next trial of the task. In certain tasks in which the subject cannot actually see how well or poorly his effort turns out, the experimenter can report on the performance, indicating success or failure (regardless of actual outcome) accordingly to experimental requirements.

Diggory (1949) found that the discrepancy between the subject's last performance and his aspiration level was about twice as great when he was asked to state what he "hoped" to do on the next trial as it was when he was asked what he "expected" to score on the next trial. Many subjects hope to do greater than they
expect to do. Ricciuti (1951) has stressed many procedural variations characteristic of this area of experimentation, Spitzer (1958) points out various problems in the methods used to run and score level of aspiration experiments.

A quite widely accepted generalization from experiments on level of aspiration is that successful performance leads to an increased level of aspiration and the failure leads to a reduced level of aspiration (Lewin et al., 1944; Child and Whiting, 1949). Knowledge, whether true or false, of what other groups have achieved or of what members of one's own group have achieved also affects goal-setting (Lewin et al., 1944).

Test-anxiety may be affected by the level of aspiration of the individual. A student aspiring too high on the test may be more disturbed and may perform more poorly than one who has an aspiration realistic to his ability.

Trapp and Kausler (1958) compared Wechsler-Bellevue digit-symbol performance and levels of aspiration of high and low test-anxious subjects. Though the actual performance of the high and low test-anxiety groups did not differ, the level of aspiration of high anxious subjects became progressively lower over the four trails. On the last two trails, the high test-anxious
subjects had significantly lower level of aspiration scores than the low anxious subjects, though they did not objectively perform more poorly than the low test-anxiety subjects. The high anxious subjects progressively become more pessimistic about their performance over the four trials. Meunier and Rule (1967) reported results leading to similar conclusions regarding the test-anxious person's tendency to devalue his own performance. The effects of three types of feedback—positive, negative and none—on the subjects' confidence in their judgements of the length of lines were investigated. On no-feedback trials, highly test-anxious subjects rated their confidence level as low which compared to their confidence on trials with negative feedback. In contrast, low test-anxious subjects expressed high confidence in their judgement on no-feedback trials, and this level of confidence corresponded to the level expressed on positive feedback trials.

5. INTELLIGENCE AND TEST-ANXIETY

One of the main bases of individual difference is the general intelligence. Some investigators have reported intellectual differences in test-anxiety as well.

In an earlier study, Sarason (1959) administered several personality tests to 309 men and 67 women and
made intercorrelations among these variables and 13 measures of intellectual performance. Among others, it was found that although all correlations between anxiety and intellectual measures were small, there was a consistently significant tendency for test-anxiety to correlate negatively with the intellectual measures; that is, the higher the intelligence the lesser was the test-anxiety.

Sarason (1959) noted frequent occurrence of test-anxiety among school children which increased with grade and correlated negatively with group measures of intelligence. Although it occurred with equal frequency in different social classes, it was found more frequently among boys than among girls.

Sarason interpreted the results of one of his studies (1963) as being consistent with the conception of anxiety as an interfering non-intellectual influence on intellectual performance. Hill and Sarason (1966) have also analysed the relationship between test-anxiety and I.Q. and achievement-test performance.

Allison (1970) administered the Test Anxiety Scale for children and the CMA Scale to 332 sixth graders. Later, subjects were given an intelligence test under a number of experimental conditions designed to induce varying amounts of stress. Analysis of covariance was made for
two levels of anxiety, five experimental conditions, and two sexes, subjects having been classified as high or low anxious on the basis of their anxiety scores. These analyses revealed that none of the effects of the main independent variables or of their interactions was significant. Results do not support either of the hypotheses that high-anxious subjects will be more adversely affected by stress, and that test-anxiety is more directly related to test-performance than is general anxiety.

Barkley and Sproule (1973) arrived at the conclusion that test anxious and unsophisticated individuals do not perform up to their capacity on test of intelligence, achievement, aptitude and short term memory.

Fischer and Awrey (1973) tested 72 undergraduates on a concept formation task after administration of Otis intelligence test as well as the Taylor Manifest Anxiety Scale of the Test-Anxiety Questionnaire. Results revealed a significant main effect for intelligence for both the manifest and the test-anxiety measures, and also a significant intelligence and test-anxiety interaction effect. When anxiety was measured by the TAQ, there was a significant decrement in performance in the low intelligence - low anxiety condition as compared to the
high intelligence-low-anxiety as well as the low intelligence - high anxiety conditions.

Koening (1973) administered a measure of test-anxiety to 60 under-graduate students. Groups of high and low test-anxious subjects were then feedback with false information concerning their emotional reactivity during the solution of some arithmatic problems. The feedback was false in the sense that high, average, or low levels of motor activities were provided without regard to subject's actual emotional behaviour. Based on earlier research, it was predicted that levels of emotional feedback would significantly affect intellectual performance and continue to produce the effect after feedback was terminated. The findings of this study indicate that while high feedback resulting in subjects' perceiving themselves as more test anxious led to performance deterioration, low feedback resulted in intermediate performance.

As already reported, Van der Ploeg and Hulshof (1984) found that debilitating effects of worry component of high test-anxiety on performance were nested among subjects in the upper range of intelligence. Best performance was of the low-anxious and high-intelligence subjects whereas the high anxious and lower-intelligence
subjects performed the worst. On the whole, less intelligent subjects achieved less and were less influenced by the impairing effects of test-anxiety.

6. ACADEMIC ACHIEVEMENT AND TEST-ANXIETY

Test anxiety is a specific case of anxiety in test or examination situations. Academic achievement is measured by some test or examination, and it should be affected by the degree of test-anxiety in the person. Test-anxiety is observed in both low as well as high achievers. It has also been seen that the performance of high test-anxious subjects may be facilitated or impaired by manipulating the experimental conditions.

Sarason (1957) studied the relationship of test-anxiety and general anxiety to entrance examinations and grade point averages. He found that the test-anxiety scores tended to correlate negatively with measures of academic achievement, although it (negative correlation) disappeared with increase in number of years in college. When data were analysed to study the extreme anxiety groups, high test-anxiety subjects performed at a significantly lower level than did the low test-anxiety subjects. Significant differences were also found within each of the low and high test-anxious groups. Thus, on entrance examination the most extreme test-anxiety group
performed at a significantly lower level than did the group of high anxious subjects with less extreme test-anxiety scores.

Sarason et al. (1960) found that test-anxiety scores were correlated with academic achievement, and the effect increased with age. However, their extensive studies demonstrated that the performance of students with high scores on test-anxiety scale may be both facilitated and impaired by experimental conditions. Personal evaluation or threat leads to decrement in the performance of high test-anxious subjects, whereas reasurance facilitates their performance; achievement-oriented instructions impair the performance of high test-anxious students, but seem to have a salutory effect on low test-anxious subjects; observing a successful model facilitated the performance of high test-anxious subjects while observing models who fail results in poorer performance. It is reasoned that test-anxiety may be caused by failure in school subjects or by difficulties seeming from relatively low intelligence, also the school failures and even the I.Q. difficulties may be increased by test-anxiety.

Frost (1969) noted conflicting evidences in regard to the relationship between anxiety and educational achievement in children but the consensus seems to
indicate a negative relation. Attempts have been made to
distinguish test-anxiety from general anxiety and to claim
a stronger relation between the test-anxiety and achievement
than between the general anxiety and achievement. The
evidence for such a distinction seems stronger in the
older age range, such as college students. It was found
that there are different relations between anxiety and
different school subjects, specifically reading and
arithmetic, such that the latter is more affected. Age,
social class, sex, and intelligence each play a part in
determining the precise relationship between anxiety
and achievement.

Hill and Sarason (1966) studied the relation of
test-anxiety and intelligence to concurrent achievement
test performance. In a study by Hill and Sarason (1966),
the relation of test-anxiety and defensiveness to test
performance was studied by analysing the test scores of
groups of boys and girls from each grade level chosen on
the basis of patterns of anxiety and defensiveness. Four
groups of subjects were selected to maximize group
differences in test-anxiety scores on TASC and lie scores
on LSC separately for each subsample and for each set of
independent variables, including: (a) 20 subjects below
the median on both the TASC and LSC, (b) 20 subjects below
the median on the TASC and above the median on the LSC,
(c) 20 subjects above the median on the TASC and below the median on the LSC, and (d) 20 subjects above the median on both the TASC and LSC. These groups are referred to as the LA-LL, LA-HL, HA-LL, and HA-HL groups, respectively. The procedures resulted in a 2 (anxiety level) x 2 (Lie Tendency level) factorial arrangement, with 20 subjects in each cell. It was found that the LSC was more highly correlated with test scores than was the DSC, especially in the case of boys.

Alpert and Haber (1960) administered scales of general anxiety (Taylor, Welsh and Freeman) and anxiety specific to academic situations (Mandler-Sarason's Achievement Anxiety Test) to College Freshmen. Academic achievement included verbal aptitude, the Scholastic Aptitude Test, overall grade-point average and performance in psychology courses. The two tests of specific anxiety were seen to be measuring something different than the more general tests and were differentially related to academic performance. "Facilitating" vs "debilitating" anxiety was distinguished.

Gaudry and Bradshaw (1970) administered an intelligence test and the TASC to students in 14 secondary classes early in the school year. Marks in mathematics in both progressive and terminal examinations were collected and analysed as a function of anxiety, intelligence, and
method of examining. The experimental hypothesis was that high test-anxious subjects would perform relatively better under the less stressful conditions of progressive examining than under terminal examining when compared with low anxious subjects in the same class. The anxiety and method of assessment interaction was found to yield significant results.

Marso (1970) studied 116 undergraduates in four groups in a four factor-analysis of covariance design to test whether more frequent graded unit examinations followed by test feedback would facilitate achievement and allow students with high measured test-anxiety to perform better on final course examination. He administered 168 examination items as either 3 or 6 unit exams. The experimental manipulation also considered grading or not grading the unit exams, and providing or not providing class feedback and discussion following the examinations. Analysis of performance on two post-test measures indicated that subjects achieved more from frequent, graded unit tests followed by feedback, However, the performance of subjects with high test-anxiety was not affected by variations of these conditions.

Bećir (1972) studied the relationship of test-anxiety with academic performance of the children controlled for intelligence. Three weeks prior to the
Boor (1972) studied the relationship of test-anxiety with academic performance of the children controlled for intelligence. Three weeks prior to the end of a grading period, 55 male and 61 female undergraduates were administered the Test Anxiety Scale, the Debilitating Achievement Anxiety Test, the Facilitating Achievement Anxiety Test, and two sub-tests of the WAIS. Examination scores of each subject were obtained and then correlated with the test measures. Among other things, it was found that none of the test-anxiety measures was significantly related to examination performance.

Prell (1973) studied the influence of anxiety by administering an enlarged German version of the Achievement Anxiety Test of Alpert and Haber (1960) to 27 male and 17 female education majors who also had to write a team paper and a longer essay and take a multiple choice test. The correlation between the "debilitating" anxiety score and total achievement was significant for the whole group as well as the females treated separately. Anxious students, specially females, had a significantly lower essay score. The multiple choice test and team work were not significantly affected. Habitual and examination anxiety were specially detrimental to achievement in
essay composition. The total score based on these three measures was not strongly correlated with achievement in the multiple choice test, less strongly with essay achievement, and least strongly with team achievement.

Tryon, Leib and Tryon (1973) administered the TASC to 246 3rd to 6th graders and tried to relate the anxiety scores to the subjects' grade placement, academic achievement, and sex. It was found that high achievers increased, low achievers decreased, and middle achievers remained unchanged in test-anxiety with increased grade placement. Berkley and Sproule (1973) arrived at the conclusion that test-anxious individuals do not perform up to their capacity on test of achievement.

Reid et al. (1973) studied 81 pairs of undergraduate algebra students paired by sex and test anxiety. They found that low anxiety and male pairs learned faster, while mixed sex and anxiety level pairs tended toward lesser achievement.

Fittkau and Langer (1974) did not find significant difference in test-anxiety and aversion to school. After completing a fourth exam, a questionnaire that measured anxiety and aversion was readministered. There was a significant decrease in anxiety and aversion in experimental subjects but
their achievement seemed unaffected in experimental as well as control subjects, meaning thereby no relationship between test-anxiety and achievement.

Rao (1974) tested the hypothesis that academic achievement is related to adjustment to academic work with adjustment reflected in anxiety scores. From half of the male undergraduates of six colleges, two groups, over-achiever (OAS) and under-achievers (UAS), were selected by using four predictor variables. These groups were administered the Academic Anxiety Test. Results showed that the two groups differed significantly in their adjustment to the academic situation as evidenced by their anxiety scores. While the under achievers were adversely affected by the presence of the debilitating type of anxiety, the over-achievers were assisted in their adjustment by the facilitating type of anxiety.

Osterhouse (1975) examined the academic performance of a total of 412 low, moderate, and high test-anxious university students (as measured by the inventory of Test-Anxiety) within two class rooms which differed significantly in the mean level of anxiety aroused by examinations. When differences in class room anxiety were not considered, a significant negative linear trend was observed between anxiety
level and academic performance. No differences were found in the academic performance of low test-anxious subjects within the two classrooms but a significant interaction was observed between classroom anxiety level and the academic performance of moderate and high test-anxious subjects. Moderate test-anxious subjects tended to obtain slightly higher examination scores in the high anxiety section than in the low anxiety section, while the opposite was true for the high test-anxious subjects.

Munz, Costello and Korabik (1975) tested the assumption that performance is a function of activation level. For this purpose they compared the Alpert - Haber Achievement Anxiety Test scores of 75 male and female undergraduates with a self report measure of activation taken prior to a classroom examination. Results support the predicted relationship between achievement-anxiety reaction type and academic performance but only partially support the hypothesis. Results suggest that an examinee experiences two general types of arousal in the testing situation — one that enhances performance and one that impades it.

Schwarzer (1975) administered German version of the TASC to 1369 4th graders. He found that lower
grades in German and mathematics were significantly associated with greater anxiety, especially for the girl subjects.

In a study by Bierhoff - Alfermann (1976), 1228 9th and 10th graders were tested for intelligence, manifest anxiety, test-anxiety, general aversion to school, extraversion — neuroticism, and dogmatism. The results were compared with their latest marks in ten subject areas. In the most selective schools the more anxious pupils performed significantly worse in eight subjects (all except biology and geography) but in the least selective schools anxious pupils performed worse only in four subjects.

Oner (1977) studied 160 high and low test-anxious 6th graders. One of his hypotheses was that high-anxious subjects would learn and perform better under feedback and supportive conditions. The task was learning decimals from a programmed mathematics book. Low-anxious subjects generally out-performed high-anxious subjects and girls did better than boys under all treatment conditions. His findings could not support the predictions based on the characteristics of high and low anxious children that were derived from the work of Sarason (1960) and his colleagues.
Limann (1977) has studied the role of test-anxiety in school achievement. For this purpose, he obtained measures of school achievement (grades) and achievement test scores (verbal, numerical, and total) from a sample of 428 5th graders. Results indicated that an increase in test-anxiety resulted in lower achievement (grades in mathematics) for more intelligent boys of lower social class. Intelligence and anxiety had an interactive effect on numerical and total scores, sex and anxiety interacted with numerical scores. A sex by social class by intelligence interaction was significant for grades in German.

Sepie and Keeling (1978) studied 246 children divided into groups of over-achievers, normal-achievers and under-achievers, in mathematics. It was found that a measure of mathematics-specific-anxiety differentiated the under-achieving group from the other two groups more strongly than the measures of general and test-anxiety.

An analysis of B. Wittmaier's (1974) data by Wittmaier (1976) revealed that compared with high test-anxious undergraduates (N=182), undergraduates with low scores on both scales of the Achievement Anxiety Test (N=42) were less anxious before a test, studied less for it, and got more sleep the night before. Low anxious
subjects also performed less well on the test and showed improved performance when made more anxious. Although not all of the differences were statistically significant, the general trend was that under-achievers had less motivation, and that the low test-anxiety indicated low motivation.

Ajwani (1986) studied 40 postgraduate students, equally distributed into high and low achieving boys and girls for their test-anxiety and attitude towards the present examination system. High achievers tended to show less test-anxiety than low achievers. Similarly, negative relationship was found between academic achievement and attitude towards the present examination system. Similar results were found in respect of the relationship between attitude towards the examination system and test-anxiety with the exception of the high achieving girls for whom a positive correlation was found. As regards the sex difference in attitude and test-anxiety, it was not significant for any of the sub-groups.