CHAPTER
TWO
ANXIETY

1. CONCEPT OF ANXIETY
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3. ANXIETY AND LEARNING
1. CONCEPT OF ANXIETY

What Ebbinghaus said about psychology that it has a long past but only a short history may be applicable to the study of anxiety. The term anxiety is derived from the Latin word, "anxius". The English usage can be traced to at least the 17th century when it meant much the same as does to-day namely a state of agitation or depression with feelings of distress. The term was introduced into psychology by Freud when he described anxiety neurosis. Different investigators have invested this term with a variety of meanings and hence the ambiguity in the status of anxiety as a psychological concept has arisen. In commenting on the lack of agreement in descriptions of anxiety, Epstein (1972) suggests that the problem of defining anxiety may be analogous to the difficulties experienced by the proverbial wise but blind men who differed dramatically in their conception of an elephant, each has touched on certain parts of its exterior anatomy.

In view of the complexity, it is not surprising that there exists in the literature various explanations or descriptions of the process of anxiety. Mandler and Sarason (1966) have proposed that anxiety occurs when an individual is interrupted in the course of executing a desired behaviour sequence and has no alternative course
of action available. The result of the interruption is an emotion of helplessness and disorganization which we call anxiety. Wolpe (1966) regards anxiety as a conditioned emotional response that may be unlearned through such counter conditioning procedures as deep muscle relaxation. Spence and Spence (1966) equate anxiety with drive level and thus arrive at the well-known prediction of an interaction effect between anxiety and task difficulty on task performance. Mine (1971) and Sarason (1972) propose that anxious person is one who attends to evaluative cues to self-generated concern about ability to do well enough and to feelings of physiological arousal. The low-anxiety person attends to the task at hand and to the operations required for dealing with it effectively. According to Spielberger (1972) anxiety is an emotional process which has four components viz. phenomenological, physiological, task performance and the conditions under which anxiety is increased or decreased.

Some definitions are based on clinical impressions and observations, introspective reports of the patients or subjects; and physiological or behavioural changes noted during the experimental situation.
According to Meyer Gross (1969) anxiety reactions carry an unpleasant emotional tone, which may, perhaps have survival values in predisposing the individual to avoid circumstances which evoke the reaction. Martin and Sroufe (1970) conceive of anxiety as a neurophysiological response that has especially strong manifestations in the hypothalamic-sympathetic-adrenal medullary system, and in the reticular systems. Arouchock (1970) defines anxiety as a state involving both somatic and psychological participation aroused by any condition which threatens the integrity of the organism, and conceived as an extension of an indescribable foreboding or dread of personal doom.

Barkovec (1976) partially agreeing with Spielberger’s conception of anxiety, gives a working definition that, anxiety may be conceptualised as a label denoting 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

Psychologists, psychoanalysts and psychiatrists have labeled anxiety in different ways. Psychologists have labeled it as ‘trait’ or ‘state’ anxiety. Psychoanalysts label it as ‘conscious’ or ‘unconscious’ anxiety
and psychiatrists have labeled it as 'free floating' or 'bound' anxiety. Description of the various anxiety types would be as follows:

1) Objective vs. Non-objective Anxiety

According to Freud objective anxiety is synonymous with fear. In this type of anxiety a real danger situation exists in the external world, and it is consciously perceived as threatening and the perception of danger evokes an anxiety reaction. Objective anxiety can also be called as conscious anxiety.

In non-objective type of anxiety the source of danger or threat is not known. Threat is in within an internal danger, and it is not consciously perceived because it has been repressed. This type of anxiety is also called as neurotic anxiety or unconscious.

2) Situational vs. General Anxiety

Anxiety occurring only in specific situation and which involves only a specific response is called as situational anxiety. This type of anxiety is also known as 'bound' anxiety. General anxiety influences all the activities of a person, it is also known as 'free floating' anxiety.
3) Acute vs. Chronic Anxiety

A sudden and intense form of anxiety is known as 'acute' anxiety. The elevated state of anxiety which persists for a long period is known as 'chronic anxiety'.

4) Active vs. Passive Anxiety

According to Roubioccu (1970) active anxiety is accompanied by increased muscle tension, acceleration and tachycardia of breathing, and it urges the individual to attack or flight. Passive anxiety is accompanied by a temporary cessation of respiration, bradycardia, and sometimes by a transitory paralysis of movement.

5) State and Trait Anxiety

Cattell and Scheier (1958, 1961) on the basis of the factor analytic studies labelled two different types of anxiety concepts as trait anxiety and state anxiety. Spielberger (1966) taking his cue from earlier studies (Cattell and Scheier, 1961), has developed a trait-state conception of anxiety which is designed to distinguish between trait anxiety and state anxiety. He suggested that much of the ambiguity and semantic confusion associated with the concept of anxiety resulted from more or less indiscriminate use of this term to refer to two related yet logically very different constructs. An anxiety state (a state) is evoked whenever a person perceives a particular stimulus or situation as potentially
dangerous or threatening to him. The term anxiety is also used to refer to relatively stable individual differences in anxiety proneness as a personality trait. Trait anxiety (a trait) is not directly manifested in behaviour but may be inferred from the frequency and the intensity of an individual's elevations in a-state over time.

A paradigmatic view of anxiety is presented in Figure 2.1. It depicts the general nature of anxiety and fuses together the common elements of a number of conceptions of anxiety previously referred to. The paradigm also emphasizes the trait and state components of anxiety as well as the differences in origins of these types of anxiety and presents a general developmental overview of anxiety.

The term 'anxious' when referred to any person has two meanings. By the first meaning we mean that a person is anxious at some occasions but not always. This is also called state anxiety. Secondly when a reference is made as an anxious person it is rather indicative of proneness or predisposition to anxiety in a person who in different stimulus situations would behave in anxious manner. This is referred as trait anxiety.
Influences personality development in ways leading to disposition to be anxious as a stable personality trait.

Other factors in the person

Continued exposure (especially in early years) to inconsistencies, service restrictions, threats, and punishments from the interpersonal environment; frustration of dependency and other important needs, with coercive controls over hostility, aggression, etc; enduring fears and conflicts.

Trait, neurotic, or chronic anxiety

Anxiety (in the trait or state form) manifested in phenomenological, physiological, and behavioural responses

State, objective or situational anxiety

Other factors in the situation

Contemporary exposure to stressful conditions in the environment

Psychological stress

FIGURE 2.1.

THE NATURE OF ANXIETY

Anxiety states (A states) are characterized by subjective consciously perceived feelings of apprehension and tension, accompanied by or associated with activation or arousal of the autonomic nervous system. Anxiety as a personality trait (A trait) would seem to imply a motive or acquired behavioural disposition that predisposes an individual to perceive a wide range of objectively nondangerous circumstances as threatening, and to respond to these with A-state reactions disproportionate in intensity to the magnitude of the objective danger.

Cattell (1970) says that there is enough similarity in the state and trait patterns to justify the popular habits of using the term anxiety for both. Spielberger, O'Neil, and Hansen (1972) state that high-trait-anxious students respond with higher levels of state anxiety than do low trait-anxious students in situations that are made stressful by failure or by ego involving instructions.

Cattell and Scheier (1961) observed that state and trait have particular loadings on questionnaire, objective personality tests and physiological response measures. Questionnaire measurement of anxiety as a trait in adults led to the construction of IPAT Anxiety Scale.
Spielberger, Gorsuch and Lushene developed State-trait anxiety inventory (STAI) in 1970. Empirical studies using STAI led Spielberger (1972) to conclude that trait anxiety predicts higher levels of state anxiety in situations that involve psychological threats. Spielberger (1977) observed that motivation or drive level is dependent upon the intensity of a person’s state anxiety in any learning task he performs than his level of trait anxiety.

Endler and Hunt (1969) suggest in understanding A-Trait and A-State the specific situations which elicits anxiety and the interaction of situations and individual differences should be studied. Development of S-R Inventory of Anxiousness is the result (Endler, Hunt, and Rosenstein 1962). Endler and Okada (1975) state that although A-Trait is a relatively stable characteristic, it is not a unidimensional trait. Blankstein (1975) found that STAI Trait measure correlated significantly with APQ-Social Anxiety but not with APQ-Physical Anxiety.

Newmark and co-workers (1975) factor-analysed MMPI clinical and validity scales together with measures of state and trait anxiety to determine the pattern of MMPI scale loadings for each of these two anxiety measures.

Bartsch and Nesselroade (1973) supported the State-Trait distinction. Studies of Wadsworth, Barker and Barker (1975) could extract only one principle axis
factor and interpreted that there is evidence of only one kind of anxiety rather than separate and distinct types.

Observations on State-Trait distinction of anxiety suggest that anxiety is a multidimensional concept and has varied manifestations.

Approaches to Anxiety

Different approaches to anxiety have been grouped into philosophical, psychodynamic, learning theory, drive theory, physiological and holistic.

Philosophical

Spinoza (May, 1950) defines fear in relation to hope, they are both characteristic of the person in doubt. He does not see conflict between hope and fear as persistent or necessary, fears can be overcome by courageous dedication to reason and hence the problem of anxiety does not confront him.

Pascal (May, 1950) felt that people want to avoid 'thoughts of themselves', because if they did self contemplation, they would be miserable and anxious.

Kierkegaard (May, 1950, and Fischer, 1970) describes anxiety as 'the possibility of freedom.' He further says that anxiety is unavoidable if man is to fulfill his development. Finally he says that, anxiety 'is afraid yet it maintains a shy intercourse with its object,
cannot look away from it indeed will not.'

Tillich (1950) says 'anxiety is the state in which a being is aware of its possible non-being.' He suggests that, the pathological anxiety once established, is an object of medical healing. Existential anxiety is an object of priestly help.

**Psychodynamic**

Freud (1936) wrote "Anxiety is a specific state of unpleasure accompanied by motor discharge along definite pathways a signal of danger -- symptoms are created in order to remove -- the situation of danger... Anxiety would be the fundamental phenomenon and the central problem of neurosis."

Freud (1961, 1962) distinguished three types of anxiety: i) objective anxiety, ii) neurotic anxiety and iii) moral anxiety. Objective anxiety may be regarded as an expression of the ego's instinct for self-preservation. Neurotic anxiety could be observed in three forms i) a general apprehensiveness, ii) anxiety firmly attached to certain ideas and iii) anxiety as it occurs in hysteria. Moral anxiety is fear of the conscience.

Adler's (Adler, 1923, Ansbacher and Ansbacher, 1956) view on anxiety could be understood in regard to his concept of 'inferiority feeling', aggression drive, and style of life. According to Adler, the individual
begins life in a state of biological inferiority and insecurity. Anxiety represents a phase of aggression turned upon the self. He considered the problem of aggression as the basis of his understanding of abnormal behaviour. Adler described anxiety as 'increased feelings of inferiority' and its consequences, the 'feeling of insecurity and inadequacy.' Jung (1959, 1960) believes that 'anxiety is the individual's reaction to the invasion of his conscious mind by irrational forces and images from the collective unconscious.'

Sullivan (1947, 1948, 1949 and 1953) considers anxiety as a source of disequilibrium which is always uncomfortable. Two such sources of disequilibrium are tensions associated with bodily needs and tensions associated with anxiety. Two types of anxiety, mild anxiety and severe anxiety, are cited by Sullivan.

Anxiety arises in one's interpersonal relations. Self system operates in such a way that person gets satisfaction from people in his environment without incurring too much of anxiety.

Horney (1950) writes "Fear is a reaction that is proportionate to the danger one has to face, whereas anxiety is a disproportionate reaction to danger or even a reaction to imaginary danger. Anxiety is defined in
relation to the feelings a child has of being isolated and helpless in a potentially hostile world. Fromm (1941) says "Man's nature, his passions, and anxieties are a cultural product, men himself is the most important creation and achievement of the continuous human effort, the record of which we call history."

Fromm-Reichman (1956, 1966) views that anxiety has close affinity to loneliness. She believes that, many of the emotional states to which psychiatrists refer as anxiety are actually states of loneliness or fear of loneliness. Fromm-Reichman (1966) says that children who succeed in breaking away from their parents early, may experience increased anxiety. Fromm-Reichman agrees with the view of Freud, Jung, Adler, Fromm and Grinker that anxiety in mild form stimulates and facilitates efficient action or thought; motivates the common bond between human beings, encourages human efforts to alloy anxiety and is the positive power of constructive defense.

According to Jacobson (1964) anxiety is primarily a signal, which is grasped as an adaptive phenomenon, the ego utilizes in its continuing development and differentiation. Anxiety means danger to the ego, provides an opportunity for the development of new and more appropriate discharge pathways i.e. new behaviours.
Fingerette (1963) defines anxiety in structural terms. Failure of striving for meaning is itself what constitutes anxiety. Anxiety may be thought of as ego disorganization. For her, the term neurotic anxiety is a misnomer. Bowlby (1970) has emphasised the role of affectional bonds in the psychopathology of anxiety. He emphasises that separation and threats of separation may lead to hatred towards the loved figure, other than evoking anxiety directly and this may cause irrational forms of pathological anxiety.

Parkes (1970) defines separation anxiety 'as the subjective accompaniment of awareness of the danger of loss.' Ibor (1961) considers 'anxiety as the key to neurosis, the neurotic symptoms whirl around it. Each historical era has a particular state of mind, and the characteristic state of mind in our days is anxiety.

Bollard and Miller (1950) consider fear or anxiety as one of the most important drives whose source is vague or obscured by repression. Eysenck (1947) views anxiety in terms of the dimensions of personality. He considers anxiety as a conditioned fear response. According to Eysenck some people are habitually anxious, and react more strongly to situations which to other, more stable persons would not seem at all anxiety-arousing.
According to Borkovec (1976) 'descriptive model for anxiety process' emphasises three aspects of anxiety phenomenon. Firstly, whatever is noticed in anxiety condition is a function of external and internal cues. Secondly, the immediate reaction in face of anxiety eliciting stimulus is characterised by subjective feelings of apprehension and tension, physiological arousal, and behavioural manifestation of arousal such as facial grimaces, trembling of hands and avoidance behaviour. Finally, he proposes that three response components operate in anxiety via. cognitive behaviour, motor behaviour and physiological reactions, and they interact with each other.

**Holistic-Orgasmic**

Goldstein (1964) states that anxiety is the context of an organism-environment relationship. Further he says that anxiety emerges, whenever, the person comes in contact with his possible worlds, and the new challenges and inadequacies posed by them. According to him the more creative the person, the greater the number of anxiety provoking situations to be encountered. The capacity to meet and overcome anxiety, is the meaning of courage.
**MAS as a measure of drive**

Taylor (1953) conceived of and developed the Manifest Anxiety Scale (MAS) as an operational measure of the general motivational (drive) level of human subjects. It allows for comparison of performance of low anxious (LA) and high anxious (HA) subjects in a variety of learning or performance tasks. In addition it allows control and/or systematic study of the relation between motivational level and performance in the absence of noxious stimulus, for example shock.

2. **MODELS OF ANXIETY**

**IOWA Model - Anxiety as an acquired drive**

A great deal of experimental work dealing with the effect of anxiety on learning has been carried out at the University of IOWA under Kenneth W. Spence. Spence (1952) conceives anxiety as an acquired drive which has the capacity to generally energize the organism. Anxiety ought therefore, to facilitate performance and increase the speed of learning. Spence's theory holds that anxiety will energize or strengthen each of the habits in the hierarchy in proportion to the initial strength of the habit the relationship to multiplicative i.e. \( R = f(E) = f(D \times H) \).
The assumption of a multiplicative relationship between drive and habit strength leads to the following predictions:

1) In simple, uncomplicated learning situations, such as classical conditioning, in which a single habit is acquired, higher drive should lead to higher levels of excitatory potential than low drive and this in turn should be reflected in higher levels of performance for the habit which is acquired.

2) In complex, even two-choice situations, the effect of increased drive depends upon two further considerations:
   a) The nature of the dominant habit evoked in the learning situation and
   b) Whether the response which corresponds to this habit is right or wrong.

Yale Model: anxiety as situationally determined reaction

The Yale theory advanced by Mandler and Sarason (1952, 1960) treated anxiety as a strong learned drive which is a situationally determined reaction. A particular circumstance or class of circumstances may be stressful for a person though he is not made anxious by other situations. Individuals may react differently to the same circumstances.

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1. A complex situation is one in which there are a number of competing response tendencies, all of which are weak in habit strength. Personality, Learning and Anxiety. In H.J. Eysenck (Ed) Handbook of Abnormal Psychology. London: Pitman, 1974 p. 333
The individual has learned or developed characteristic responses to anxiety which he brings with him to the current situation. These relations may be task-irrelevant, that is, tendency to disrupt performance, for example feeling of inadequacy, fear of failure, desire to quit the situation or they may be task relevant, facilitative of performance because they move the person to reduce anxiety by completing the task successfully.

The effect of anxiety is also a function of such aspects of the situation as the attitude of the experimenter or teacher and the meaning of task as perceived by the individual. The factors are of greater significance than the complexity or difficulty of the task.

There may be a general trait of anxiety but behavioural science is not yet prepared to investigate it. It is first necessary to thoroughly study important situational anxieties.

According to Take theory the study of anxiety should begin with examination in depth of particular stressful situation not achieving, not accomplishing, not performing up to a standard which is regarded as highly stressful. Many specific situations might evoke achievement anxiety depending upon individual’s personal
goals and values. Test anxiety is a near universal phenomenon.

Yerkes-Dodson law

This holds that relationship between fear, conceptualized as drive and learning is curvilinear. A low level of drive facilitates learning slightly or not at all presumably because the motivation it provides is inadequate to affect performance. A high drive level interferes with the learning process so that performance is similar or worse than that obtained with low drive level. The level of drive which stimulates optimal performance lies somewhere in the middle range of drive intensity.

The law further states that the relationship between drive and performance is a function of task complexity. The optimal drive level is higher when the task is simple than it is complex, a drive level that facilitates performance on a single task may disrupt it, when the task is more difficult.

Though the above models view anxiety as a drive in different ways, in most circumstances, predictions that may be derived from Spence's theory are identical whether one assumes that NA scale measures chronic (trait) or situational (state)
In much of the research stimulated by or designed to test Drive Theory, the performance of individual's characterized by low and high levels of emotionally based drive (n), as this was measured by M&G score, has been compared on a variety of learning tasks. The experimental evidence on which Drive Theory rested was reviewed by Taylor (1956).

3. Anxiety and Learning

a) Anxiety (Drive) and Simple Learning

Laboratory investigations of classical conditioning, human maze learning and serial and paired associate verbal learning have provided empirical findings consistent with the predictions of Drive Theory. Since a single response tendency is usually acquired in classical conditioning, drive theory would predict that HA subjects would give more conditioned responses than LA subjects. Superior conditioning for HA subjects was indeed found in six independent eyelid conditioning studies reviewed by Taylor (1956). Spence (1964) has surveyed the eyeblink conditioning literature. He found that in 21 of 26 studies subjects who scored high on the M&G showed significantly higher levels of performance than subjects who scored low on the M&G. Spence's review of the literature seems to indicate that the interpretation of the M&G as a drive is supported by eyeblink
conditioning studies could not find support in any classical conditioning situation in which the acquisition of a single habit is under investigation. Bindra, Paterson, and Streszecky (1956) have reported that differences on the MAS are unrelated to performance in a salivary conditioning task. Hilgard, Jones and Kaplan (1951) have suggested that subjects who score high on the MAS are worried defensive individuals who come into the conditioning situation with strong response tendencies to blink and to winces. Since eyelid reflex is a defensive, avoidance phenomenon nature's way of protecting the eye from potential harm, Hilgard et al. suggest that the NA individuals demonstrate more rapid eyelid conditioning because of stronger fear of bodily harm rather than because of the energizing effects of anxiety. The findings of Bindra et al. (1955) and Hilgard and his associates (1951) suggest some validity for the contention that the effect of anxiety on speed of conditioning of the eyelid reflex is specific rather than general.

b) Anxiety and Complex Learning

In addition to relating MAS to eyelink conditioning, research has dealt with the relationship between the MAS and performance in a variety of other types of task.
On the assumption that errors in complex learning are determined largely by erroneous responses evoked by an experimental task, it would be predicted from Drive Theory that high drive (HA) subjects would make more errors on complex task than low drive (LA) subjects and experiments (Farber and Spence, 1953; Taylor and Spence, 1952) provided evidence consistent with these theoretical expectations. In these studies the overall performance of HA subjects on complex serial maze tasks was inferior to that of LA subjects. Furthermore, the degree of inferiority of the HA groups at individual maze choice-points increased as a positive function of the number of errors (competing responses) for the choice-point. Lucas (1952) and Montague (1953) found that the performance of LA subjects increased relative to HA subjects as the degree of intralist similarity increased (thus increasing the complexity and the level of competing responses.). Similarly Spielberger and Smith (1966) found that the effects of anxiety were dependent on the serial position effect. In the middle of list (where there are many competing responses) high anxiety produced lower performance than low anxiety. Similar results have been obtained in paired associates learning studies (Spence 1958; Taylor, 1958; Taylor and Chapman, 1955;
Stevenson and Odem, 1963) Denny (1966) and Forbes (1969) have shown that stress and anxiety have debilitating effects on concept learning.

Other predictions may be derived from the Taylor-Spence theory depending on the nature of the initially dominant response in the learning task. When $D$ is varied in terms of MA scores HA subjects are expected to be superior to LA subjects where the correct response is dominant. With the reverse situation, where incorrect responses are initially dominant, the performance of HA subjects would be predicted to be initially inferior to LA subjects, followed by superior performance of HA subjects at the point in learning where correct responses attain dominance in the response hierarchy. These predictions simply interact between level of performance and anxiety ($D$) level in complex learning tasks involving initially strong competing responses. The studies conducted by Spielberg and Smith (1966); Gorth et al (1968) and Lekaerezyk and Hill (1969) provided evidence consistent with the above predictions.

Taylor (1956) has noted that failure to find performance facilitation for HA subjects on elements of complex task for which there was little evidence of competing response tendencies could be interpreted as
discrepant with expectation based on Drive Theory. In commenting on the effects of anxiety on performance on complex task Child comments:

In complex situation, where the subject is already in conflict between various response tendencies relevant to the task, the presence of irrelevant responses made to anxiety heightens the conflict and interferes with performance to a greater extent than the increased drive improves it. 2

When the correct responses are initially strong, performance should be positively related to the drive level. Conversely, if the correct to be-learned response is weaker than wrong alternative responses, than the higher drive level, the poorer will be performance during the early stages of learning. However, as learning of the correct responses increases over the trials, the habit strength of the responses would be expected to equal and then exceed those of competing responses. Thus the performance of high drive groups should become superior in later stages of learning.

Another important finding has been that the performance of HA subjects in learning tasks is enhanced by feedback and reinforcement. Sarason and Ganzer (1963) found that high test anxious subjects responded more to reinforcement in a verbal learning task than low test

anxious subjects. Conpeau (1968) found that in programmed instruction high anxious females do best with feedback, while low anxious subjects do better than HA subjects with no feedback.

Several studies have specifically investigated the relationship between anxiety, memory and complex learning tasks. Sieber and Kamaya (1968) found that anxious subjects, although without memory support their performance was poorer. Poulson (1969), using a concept learning task, found that memory support and anxiety both had effects but there was no interaction. This would indicate the LA subjects profited just as much from memory support as did HA subjects and would not lead to the conclusion that anxiety interfered with memory.

Mueller (1976) argued that there were at least two different effects that anxiety might have on learning and storage: quantitative and qualitative. Quantitatively, the effects of anxiety on learning have been investigated most thoroughly with the digit-span task. There is not simple relationship between anxiety and digit-span performance. For example, Hodges and Spielberger (1969) found that digit span was negatively related to the level of trait anxiety, whereas Knox and Grippaldi (1970) observed the best digit-span performance in those with a medium level of state and trait anxiety. Hodges and Durham (1972) obtained an interaction between intelligence
and anxiety with high intelligence enhancing digit-span performance for high anxiety subjects, but have a detrimental effect on low-anxiety subjects. Mueller (1976) found no effects of anxiety on digit span in several studies. The evidence suggests that stress and high levels of state anxiety have a detrimental effect on digit span, whereas trait anxiety has negligible effects.

Possible qualitative effects of anxiety on learning were also investigated by Mueller (1976). He linked Easterbrook’s (1959) hypothesis with Craik and Lockhart’s (1972) depth-of-processing hypothesis, and argued that anxious or aroused subjects would utilize fewer of the available attributes when encoding information. This notion was considered in a series of experiments on free recall. High-anxiety subjects initially demonstrated less clustering in recall than low-anxiety subjects, but this difference was reduced as learning progressed. These findings indicate that high-anxiety subjects are less likely to use semantic features of presented material during learning, but do not reveal what organizational methods they are using.

Bartel, DuCette, and Nolke (1972) also found that subjects apparently high in anxiety showed less clustering in recall of a categorized word list than did low-anxiety subjects. Mueller (1976) argued that
high-anxiety subjects manifest restricted encoding of to-be-remembered material, and yet the nature of the encoding process used by high-anxiety subjects is unknown. It is possible, for example, that high-anxiety subjects are organizing the input either imaginarily or conceptually, in ways which the clustering measures fail to reveal. Furthermore, it is not necessarily the case that the effects of anxiety on clustering occur at the encoding stage.

Albert, Dietrich (1981) proposes a dual effect of anxiety on learning performance. Anxiety is assumed to facilitate threat relevant responses but also to diminish threat irrelevant responses. Additionally, each response in a learning situation is classified as being either task relevant or irrelevant. Learning is assumed to strengthen the task relevant responses.

Tobias Model

Anxiety is an affective state since learning is a process that is essentially cognitively mediated, anxiety can affect learning only indirectly by an impact on the cognitive processes mediated learning at various stages. According to Tobias et al (1979) it is hypothesized that there are three possible points where anxiety can have the largest effect on learning from instructions; a) preprocessing b) during processing
c) right after processing and just before output.

At the processing stage anxiety can have impact on learning by interfering with the input (external stimulation) that has been internally registered. Anxious students divide their attention between demands of the task and preoccupations with somatic concerns and negative self-references. Less anxious students generally devote more of their attention to task demands and less concern to task demands and less concern to task irrelevant preoccupations. Preprocessing interference is most debilitating to students since the greater the restrictions of input, the smaller the proportion of the instructional content available for processing.

During the processing stage anxiety has an impact on instruction directly by affecting the cognitive operations performed to process input. At this point three types of manipulations are likely to have the clearest effect on learning.

a) Difficulty of the task—Reduction in difficulty of the task is differentially effective for anxious students.

b) Reliance on memory—Instructional methods in which students are required to rely on short term or immediate memory are subject to greater interference for
anxious students than content retrieved from long term memory.

b) Organization of the task - Any material that assures better organization of input is expected to be differentially effective for anxious students.

In the post-processing, interference in retrieving content mastered during the processing stage affects performance.