2.1 Concept of Psychophysiological Disorder

The term Psychophysiological disorders is now preferred to the one that was known as psychosomatic disorders. Psychosomatic connotes the principal feature of those disorders in which the psyche or mind has an untoward effect on the soma or body of an individual rather than from immediate physical agents like those involved in organic disorders.

At the outset, two important points must be firmly established. First, a psychoph physiological disorder is a real disease involving damage to the body. Second, such disorders are different from the conversion disorders in that the latter do not involve actual organic damage to the body. Psychophysiological disorders as such do not appear in DSM-III-R as they did in earlier version of the DSM. Because virtually all physical diseases are now viewed as potentially related to psychological stress.

2.1.1 Theories of Psychosomatic Disorders

Regarding origin of psychosomatic disorders there are various theories. Regardless of their differences, for most part they subscribe to the following over-simplified general paradigm:

Stimulus Situation → Physiological → Psychophysiological Reactivity → Disorder
Theories concerning the genesis and development of psychosomatic disorders may be classified under two major categories.

(a) Physiological approaches attribute a particular psychophysiological disorder to specific weakness or overactivity of an individual's organ systems in responding to stress;

(b) Psychological theories account for specificity by positing particular emotional states for particular disorders.

2.1.2 Categories of Psychophysiological Disorders

Broadly the psychophysiological disorders may be put in two main categories called primary psychophysiological disorders and secondary psychophysiological disorders. In the first one, the major determinants are psychological. This includes cardiovascular disorders (hypertension, coronary heart disease), respiratory disorder e.g., bronchial asthma, gastrointestinal disorders, chronic pain, etc. In secondary psychosomatic disorders, psychological determinants play only a minor role in the genesis of pathological condition. These includes cancer, pulmonary tuberculosis, cold coryza, etc. (Lachman, 1972).

2.1.3 Bronchial Asthma

Bronchial asthma is recurrent obstructive disease of bronchial airways, which tends to respond by bronchoconstriction, edema
(an accumulation of excess watery fluid in the tissues) and excessive secretion to a variety of stimuli. Allergens, pulmonary infection (especially with virus), emotional arousal, cold air, odours, exercise, and irritation of nasal passage by dust, fumes and gases may singly or in combination incite broncho constriction (Weiner, 1985).

The extrinsic and intrinsic forms of bronchial asthma are two main forms recognized. Approximately 30 to 50 per cent of all patients suffer from the extrinsic form. This form is characterized by allergic mechanisms that are necessary but not sufficient to precipitate clinical attack. Patients with extrinsic asthma have a tendency to form a gamut of chemical substance capable of producing an asthmatic attack. Additional factors are also needed to account for the usually extrinsic nature of bronchial asthma. Experts in this area acknowledge that, in some patients with extrinsic asthma, psychological factors play a predisposing and initiating role in the disease and also in its recurrences.

Intrinsic asthma is usually found in patients who are over 40 years of age. In this age group the influence of hereditary, familial, or pre-existing allergic factors is less evident. They tend, however, to be sensitive to certain drugs. Intrinsic asthma may also follow a viral infection of lungs.

Asthmatic attacks occur intermittently and with variable severity: the frequency of some patients' attacks may
increase seasonally when certain pollens are present. The airways are not continually blocked; rather the respiratory system returns to normal either spontaneously or after treatment, then allowing asthma to be differentiated from chronic respiratory problem like emphysema (Creer, 1982).

Most often asthmatic attacks begin suddenly. The patient has a sense of tightness in chest, wheezes, coughs and expectorates sputum. Subjective reactions include panic-fear, irritability, and fatigue (Kinsman, Spector, Shucard and Luparello, 1974). A severe attack is a very frightening experience indeed. The immense difficulty of getting air into and out of the lungs feels like suffocation, and the raspy, harsh noise of the gasping, wheezing and coughing compounds the individual's terror. These sounds are referred to as rales. Symptoms may last an hour or less or may continue for several hours or sometimes even days.

2.1.4 Gastro-Intestinal Ulcer

The most frequently mentioned example of a gastro-intestinal disorder believed to be of psychophysiological origin is gastro-intestinal ulcer (GI ulcer) or peptic ulcer. Peptic ulcer represents a demarcated erosion in mucosal lining of the gastrointestinal tract that extends through the underlying muscularis mucosa occurring only in areas adjacent to or containing secretory cells of the gastric type. Sometimes it is named in terms of location so it is called stomach or
gastric and duodenal ulcer located in the proximal part of the duodenum. Previously, it had been assumed that peptic ulcer was a single disorder. It is now accepted that gastric and duodenal ulcer (DU) represent different disorders with dissimilar genetic, epidemiological and physiological characteristics.

Peptic ulcer disease (PUD) refers to ulcerating lesions in the stomach or duodenum (the first part of the small intestine). Peptic ulcers are associated with epigastric pain, usually occurring several hours after eating and relieved by food, although gastrointestinal bleeding and vomiting due to pyloric obstruction are often the presenting symptoms (Deckelbaum et al., 1974). The peptic ulcer results from an excessive flow of the stomach's acid-containing digestive juice, which eat away the lining of the stomach or duodenum. Although dietary factors, disease, and other organic conditions may be causally involved in many cases, a high activity level, in particular, has been found to be a frequent correlate of gastric lesions (Weiss, 1984). Consistent with the multifactorial concept of stress, Walker, Luther, Samloff and Feldman (1988) developed a theoretical model that incorporated psychosocial, behavioural, physiological and genetic factors into the likely complex relationship between life events (potential stressors), and peptic ulcer disease. This model presented in Figure 2.1 is consistent with past research implicating multiple pathogenetic factors.
Fig. 2.1 Theoretical model demonstrating the possible relationships among life events (potential stressors), various possible mediating factors, and ulcer disease. The broken line leading from life events to ulcer indicates that the model is potentially circular, i.e., that ulcer may be a result or cause of distress, or both.

Inspection of this theoretical model reveals that it is circular and does not necessarily imply a linear cause-and-effect relationship between psychological factors and peptic ulcer disease. Emotional distress, perhaps in combination with additional risk factors, may precede ulcer development (Peters & Richardson, 1983). On the other hand, development of peptic ulcer disease (PUD) may become, in and of itself, a stressful life event that results in emotional distress.

2.2 Stress: Concept and Assessment

There are many difficulties in reaching an acceptable definition of the term stress because of its widespread use and multiplicity of meanings. It has been used to mean a stimulus (for example, being exposed to a stressful situation), a response (for example, behaving in a particular manner) or as a subjective experience (for example, in the sense of 'feeling under stress'). There has also been a tendency to view stress as a single event or response when, in fact, it may comprise a series of such events and responses. There is good evidence to support the notion that stress may be best seen in terms of an individual's interaction with the event, rather than as an univariate, unidirectional concept. Stressors are those events that are perceived and experienced by an individual as stressful. The subjective experiences are called stress and the behaviours and reactions that occur in response to these stressors are referred to as stress responses. The whole concept of 'stress' is seen as dynamic.
interactional process rather than a single event or set of responses. In essence, stressors make some sort of demand—physical, psychological or some mixture of two—which requires the individual to assess and understand the situation and then to respond to it.

All the individuals in the course of living experience a variety of events or life changes, which may be considered potential stressors. Included here are such diverse events as death of spouse, illness of family member, marriage, separation or divorce, change in residence, etc. These events often require a significant social readjustment and adaptation, nobody is immune from experiencing such changes. These changes represent ongoing source of stress to which all individuals are subject to a greater or less degree. Holmes and Rahe (1967) extrapolating from types of events that they extracted from life 'event' recording case histories of patients admitted to treatment for medical problems, defined stressful life events as those "whose advent is either indicative of or requires a significant change in the ongoing life pattern of the individual."

In the current studies, life event is defined as stressful if "it causes changes in, and demands readjustment of, an average person's normal routine" (Holmes & Rahe, 1967; Dohrenwend & Dohrenwend, 1974; Holmes & Masuda, 1974). This definition indicates broad agreement at a highly abstract level concerning what is stressful about life events apart from their outcome. The agreement centres on the idea that
stressful life events include those that involve change in the usual activities of most individuals who experience them.

Despite the general lack of consensus as to the meaning of stress, there has been a large and expanding literature suggesting that both external events and internal states are linked to both disease and illness in some causal fashion. There have been a number of strands of research, based both in the laboratory and in the clinical setting, that lead to such a broad generalization. In the laboratory, it is clear that various stimuli ranging from the physical to the cognitive can produce changes in the cardiovascular system and in neuroendocrine responses (see Burchfield, 1985) as well as other psychophysical and bio-chemical changes. In the clinical arena, links have been made between various illnesses and both major and minor life events (e.g., Weinberger, Hiner & Tierney, 1987). Stress as defined in this context is essentially a psychological phenomenon: How this psychological activity translates into a physical reality is not known.

Systematic research into psychosomatics began way back in the late sixties and developed in two successive phases. The first phase, based on the work of Holmes and Rahe (1967), involved the construction and validation of an objective instrument designed to measure the weight of several life stress events. The more recent second phase sought to perfect the scaling system of the measurement instrument so as to permit a clearer vision of the relationship between the events
and onset of illness. Holmes and Rahe (1967) made their initial attempt in the development of instrument for the assessment of life stress in the form of Schedule of Recent Experiences (SRE). Although the development of the SRE represents a valuable initial attempt at the quantification of the impact of life change, its adequacy has been questioned on several counts (Rabkin and Struening, 1976). The SRE was based on the assumption that life changes per se are stressful regardless of the desirability of the events experienced. Therefore, both desirable and undesirable events are combined in determining the life stress score. Several investigators, however, have questioned the logic of combining positive and negative events (Brown, 1974; Mechanic, 1975; Sarason, DecMonchaux & Hunt, 1975). It has been argued that undesirable events may have a very different, and possibly a more detrimental effect on individuals than positive events, (See Agarwal & Maidu, 1988). Earlier, Vinokur and Selzer (1975) have provided information bearing on these two points. They employed modified version of SRE which yielded separate values for positive and negative events and were able to determine significant relationship between negative change and indices of depression, anxiety-tension, aggression, paranoia and suicidal proclivity. Positive change was not found to be systematically related to any of these measures. More recently, Sarason, Johson and Siegal (1978) developed a new assessment measure, the Life Experiences Survey (LES). LES is a 57- item self-report measure that allows respondents to
indicate events that they have experienced during past year. The format of the LES calls for subjects to rate separately the desirability and impact they have experienced. They are asked to indicate those events experienced during the past year as well as whether they viewed the event as being positive or negative and the perceived impact of the particular event on their life. Ratings are on a 7-point scale ranging from -3 to +3. Summing the impact ratings of events designated as positive by the subject provides a positive change score. A negative change score is derived by summing the impact ratings of those events experienced as negative by the subject.

Presumptive Stressful Life Events Scale (PSLES), a suitable scale of stressful life events experienced by the Indian population, has been constructed and standardized by Singh, Kaur, and Kaur (1984). This has two time space that is, last one year and life time. PSLES consists of 51 items relating to stressful life events. The scale items have been further divided into desirable, undesirable and ambiguous and also into personal and interpersonal categories. Statistical difference has also been observed between the desirable and undesirable items, the latter being perceived as more stressful.

Some other methodological issues in life stress with particular reference to India has been highlighted by Sharma (1988). These include (i) formation of event list, (ii) severity rating of events, (iii) summation of event scores,
(iv) reliability of event reporting; and (v) qualitative analysis of data that adds to the specificity of research beyond a simple counting of events. More recently, Agarwal and Naidu (1988) administered their Scale of Stressful Experiences of Students (SSES) and a strain measure to 100 students of Allahabad University. They observed that the correlation for undesirable events with measures of strain was higher than those for desirable and ambiguous events. On the basis of their findings they suggested that the exclusion of desirable and ambiguous events will result in shorter stress scales with enhanced power of predicting strains.

2.3 Anxiety: Concept and Assessment

A systematic study of anxiety started with Freud's conceptualization of it as a signal of danger and later as constituting three main attributes; a specific unpleasurable quality, efferent or discharge phenomenon and perception of these. Later, neo-Freudians, Honey, Goldstein, May, Rogers, Sullivan, Fromm - Reichman, and Bosowitz, Persky, Korchin and Grinker, presented views, more or less consistent with Freud's formulations.

Spielberger (1972) asserted that much of ambiguity and semantic confusion associated with the concept of anxiety resulted from more or less indiscriminate use of this term to refer to two related, yet logically very different concepts. Distinction between A-Trait and A-State has clarified semantic
confusion considerably and has helped to procure anxiety a conceptual status as a scientific construct.

Initially influenced by (Cattell & Scheier's 1961; Cattell, 1966) factor analytic approach to personality and their studies of mood states, Spielberger (1966, 1971, 1972, 1975) maintained that an adequate theory of anxiety must distinguish between anxiety as a transitory state (A-State) and as a relatively stable personality trait (A-Trait). A comprehensive theory of anxiety must differentiate between the situations that evoke anxiety reactions, the properties of anxiety states, the complex psychobiological processes that mediate between stressful stimuli and emotional responses, and the nature of anxiety as a personality trait.

**Anxiety as a Trait**

In general, personality traits have been described as relatively enduring individual differences among people in specifiable tendencies to perceive the world in a certain way and in disposition to react or behave in a specified manner with predictable regularity. Personality traits reflect individual differences in the frequency and intensity with which certain emotional states have been manifested and in the probability of occurrence of such states in future. Frequency and intensity of an emotional state depend upon the strength of personality traits (See Spielberger, 1966, 1972, & 1975).

Specifically, anxiety as a personality trait (A-Trait) has been defined in terms of relatively stable individual
differences in anxiety proneness, i.e., to perceive a variety of situations as threatening and to respond to these situations with differential elevations in state anxiety (Spielberger, 1966, 1972, & 1975). A-Trait may also be regarded as reflecting individual differences in the frequency and the intensity with which A-States have been manifested in the past, and the probability that such states will be experienced in the future. Persons who are high in A-Trait tend to perceive a large number of situations as dangerous or than persons who are low in A-Trait and respond to threatening situations with A-State elevations of greater intensity. While there is a wide agreement that is necessary to differentiate between state anxiety and trait anxiety (Spielberger, 1972) and trait anxiety will be of advantage in the domain of test anxiety (a situation specific trait anxiety).

**Anxiety as a State**

Personality states are necessarily transitory in nature and can be evoked only by a suitable stimulus in a particular situation. They are as enduring as the evoking conditions. Quality and intensity are the unique and distinctive features of personality state. State anxiety (A-State) has been conceptualized, by Spielberger (1966, 1972, 1975) as a transitory emotional state or condition of human organism that varies in intensity and fluctuates overtime. This condition is characterized by subjective, consciously perceived feelings of tension and apprehension, and activation of the autonomic
nervous system (ANS). The level of A-State should be high in circumstances that are perceived by an individual to be threatening, irrespective of the subjective danger, A-State intensity should be relatively low in non-stressful situations, as in circumstances in which an existing danger is not perceived as threatening.

**Anxiety as Process**

The term anxiety is also used to refer to a complex psychobiological process (Spielberger, 1972). In essence, the concept of anxiety as a process implies a theory of anxiety that includes stress, threat and state anxiety as fundamental constructs or variables. Thus, anxiety-as-process refers to a sequence of cognitive, affective, psychological and behavioural events. This process may be initiated by a stressful external stimulus that is perceived or interpreted as dangerous or threatening, or by a thought or idea that forecasts threat or that causes the individual to recall an earlier danger situation. Cognitive appraisals of danger are immediately followed by A-State reactions, or by an increment in the level of A-State intensity. It should be noted that while an anxiety state lies at the base of the anxiety process, this process also involves stress, threat physiological changes, and behavioural reactions. The concept of anxiety-as-process implies the following temporally ordered sequence:
External Danger \( \rightarrow \) Perception of Danger \( \rightarrow \) Emotional Reactions

\[
\begin{align*}
\text{(Stress)} & \rightarrow \text{(Threat)} & \rightarrow \text{(State Anxiety)}
\end{align*}
\]

Spielberger (1966, 1972, 1975) provided a conceptual frame of reference for classifying the major variables that should be considered in anxiety research and suggested possible interrelationships among these variables.

A schematic diagram of Trait-State Anxiety Theory is presented in Figure 2.2 which provides a cross sectional analysis of anxiety phenomenon. The theory assumes that the arousal of anxiety states involves a process or sequence of temporally ordered events initiated by either external or internal stimuli that one perceived to be dangerous or threatening by an individual. As previously noted, situations or circumstances in which personal adequacy is evaluated are likely to be perceived as more threatening by high A-Trait individuals than by persons who are low in A-Trait. It should be noted, however, that the appraisal of a particular stimulus or situation as threatening is also influenced by a person's aptitude, abilities, and past experience, as well as by his level of A-Trait and the objective danger that is inherent in the situation.

Once a stimulus situation is appraised as threatening it is assumed: (i) An A-State reaction will be evoked; and (ii) the intensity of this reaction will be proportional to the amount of threat the situation poses for the individual. It is further assumed that the duration of the A-State reaction
will depend upon the persistence of the evoking stimuli and the individual's previous experience in dealing with similar circumstances. Stressful situations that are encountered frequently may lead an individual to develop effective coping responses that quickly alleviate or minimize the danger and thereby immediately reduce level of A-State intensity. A person may also respond to threatening situations with defensive processes that serve to reduce the intensity of A-State reactions. High levels of A-State intensity are experienced as unpleasant and may serve to initiate cognitive or motoric processes that have effectively reduced A-State in the past.

It has also been noted previously that the two important classes of stressor situations can be identified that appear to have different implications for the evocation of A-State in persons who differ in A-Trait: (i) individuals with high A-Trait appear to interpret circumstances in which their personal adequacy is evaluated as more threatening than do low A-Trait individuals; and (ii) situations that are characterized by physical danger are not interpreted as differentially threatening by high and low A-Trait subjects. Accordingly, differential elevations in A-State would be expected for persons who differ in A-Trait under circumstances characterized by some threat to self-esteem, but not in situations that involve physical danger unless personal adequacy is also threatened.
The Taylor's (1953) Manifest Anxiety Scale (MAS) and the Mandler-Sarason's (Mandler & Sarason, 1952) Test Anxiety Questionnaire (TAQ) were among the first of psychometric instruments developed to assess individual differences in anxiety in adults. Other instruments designed to assess anxiety in adults have been constructed by Cattell and Scheier (1963), Endler, Hunt and Rosentein (1962), Spielberger et al. (1970) and Zuckerman (1960). General (Trait) anxiety scales developed in India include Sinha's Anxiety Scale (Sinha, D., 1962, 1965) and its shorter version (Khan & Hassan, 1981); Taylor Manifest Anxiety Scale (MAS) (Singh & Thakur, 1968); Cattell and Scheier's IPAT Anxiety Scale (Hundal and Kaur, 1974); Comprehensive Test of Anxiety (Sinha, A.K.P. & Sinha, L.N.K., 1969; Krishna, 1970); Hindi version of State-Trait Anxiety Inventory (Spielberger, Sharma & Singh, 1973, Spielberger & Sharma, 1976). Recently, Tripathi and Rastogi (1978) have developed an anxiety scale in which items for state trait anxiety and also items for free-floating anxiety have been included.

As indicated earlier, most of the scales developed to assess anxiety appear to measure trait anxiety, i.e., individual differences in anxiety proneness. In current research the Taylor MAS, the IPAT Anxiety Scale, and the A-Trait Scale of the State-Trait Anxiety Inventory (STAI) are used most often for the assessment of trait anxiety. These three scales are highly correlated with one another and appear to measure anxiety proneness in social evaluative, situations (Spielberger et al., 1970).
The STAI has been developed to provide relatively brief homogeneous self-report measure of both state (A-State) and trait (A-Trait) anxiety (Spielberger, 1966, 1972, 1975). The item selection and validation procedures that were employed in the construction of the STAI are described in detail by Spielberger et al. (1970). Both A-State and A-Trait scales of STAI consist of 20 items. Each A-Trait item has been determined to be impervious to situational stress and is relatively stable over time.

2.4 Anger: Concept and Assessment

In the psychological and psychiatric literature, anger, hostility, and aggression generally refer to different though relative phenomena but these terms are often used interchangeably (Berkowitz, 1962; Buss, 1961). Given substantial overlap in the prevailing conceptual definition of anger, hostility, and aggression, were collectively referred as the AHA! Syndrome (Spielberger, Johnson, Russell, Crane, Jacobs, & Worden, 1985). On the basis of a careful examination of the research literature on anger, hostility, and aggression, Spielberger, Jacobs, Russell and Crane (1983) proposed the working definition of anger, hostility and aggression: "The concept of anger usually refers to an emotional state that consists of feelings that vary in intensity, from mild irritation or annoyance to intense fury and rage. Although hostility usually involves angry feelings, this concept has the connotation of a complex set of attitudes
that motivate aggressive behaviours directed towards destroying objects or injuring other people. While anger and hostility refer to feelings and attitudes, the concept of aggression generally implies destructive or punitive behaviour directed towards other persons or objects." Given these definitional conventions, it follows that the emotion of anger is a necessary, but not a sufficient, condition for the development of hostile attitudes and the manifestation of aggressive behaviour. Spielberger et al. (1983) distinguishes between State anger (S-Anger) and Trait anger (T-Anger). S-Anger was defined as an emotional state or condition that consists of subjective feelings of irritation, annoyance, fury and rage with concomitant activation or arousal of autonomic nervous system. It was further assumed that S-Anger will vary in intensity and fluctuate over time as a function of perceived affronts, being attacked or treated unfairly, or frustration resulting from the blocking of goal-directed behaviour. Trait-anger (T-Anger) was operationally defined in terms of individual differences in the frequency that S-Anger was experienced over time. It was assumed that persons high in T-Anger would be more likely to perceive a wider range of situations as anger provoking (e.g. annoying, irritating, frustrating) than individuals low in T-Anger, and to respond to such situations with elevations in S-Anger.

The expression of anger must be distinguished, conceptually and empirically, from the experience of anger as an emotional state and individual differences in
anger-proneness as a personality trait. In previous research on anger expression, individuals were typically classified as "anger out" if they expressed anger toward other persons or objects in the environment (e.g., Funkenstein, King & Drolette, 1954). "Anger-out" generally involves an increase in S-Anger and the manifestation of aggressive behaviour. Persons who direct their anger inward toward the ego or self, or who hold in (suppress their anger, are classified as "anger-in" (Averill, 1982, Funkenstein et al. 1954; Tavris, 1982).

In a study by Novaco, (1977) anger is viewed as an emotional response to provocation i.e., determined by three modalities of personal variables: cognitive, somatic-affective and behavioural. At the cognitive level, anger is a function of appraisals, attributions, expectations and self-statements that occur in the context of provocation. In the somatic-affective modality, anger is primed and exacerbated by tension, agitation and ill-humour. Behaviourally, both withdrawal and antagonism contribute to anger.

The need to distinguish between anger and hostility was explicitly recognized in early 1970s by the appearance of three anger scales in the psychological literature. The Reaction Inventory (RI), the Anger Inventory (AI), and the Anger Self-Report (ASR). The RI was developed by Evans and Stangeland (1971) to assess the degree to which anger was evoked in a number of specific situations. Subjects report the amount of anger they believe they would experience in each
situation by rating themselves on a 5-point scale, from "Not at all to "Very much." Novaco's (1975) Anger Inventory is similar in conception and format to the RI, consisting of 90 statements that describe anger provoking incidents. Subjects rate on a 5-point scale, the degree to which each incident would anger or provoke them. He reported high internal consistency (Chronbach alpha = .96). Biaggio, Supplee and Curtis (1981) reported the test-retest stability of the AI over a brief two week interval, was only .17. Zelin, Adler, and Meyerson (1972) designed the Anger-Self-Report (ASR) to assess both the experience and expression of anger. The ASR is comprised of seven subscales: "Awareness of Anger" three separate subscales for measuring different modes of anger expression" "Condemnation of Anger," "Mistrust," and "Guilt." In validating this scale Zelin et al. (1972) found that ASR scores of psychiatric patients correlated significantly with psychiatrist's ratings of anger, and that college student's ASR "awareness of anger" scores correlated significantly with acquaintances' peer ratings of angry feelings. The ASR and RI have been used in only one or two studies over the past 15 years, the construct validity of these scales has yet to be firmly established. While the AI has been used more often in research than the other anger measures Biaggio, Supplee and Curtis (1981) found no significant correlations of this scale with self and observer ratings of anger and hostility.
Empirical efforts to assess anger, as distinguished from hostility and aggression, reflect an important theoretical development in research on the AHA! Syndrome. There are however, a number of limitations inherent in the three anger scales described above. For example none of these scales adequately distinguishes between anger as an emotional state (angry feelings) and individual differences in anger proneness as a personality trait.

In order to measure the fundamental properties of anger it is essential to assess the intensity of angry feelings that are experienced at a particular time, the frequency that anger is experienced, and whether anger is held in (suppressed) or expressed in aggressive behaviour directed toward other persons or objects in the environment. Recent research further suggests that it is also important to evaluate the degree to which a person endeavours to control anger (Spielberger et al., 1985). The State—Trait Anger Scale (STAS) was designed to assess the intensity of anger as an emotional state and individual difference in anger proneness as a personality trait (Spielberger, 1980; Spielberger et al., 1983). Recently, Siegel (1986) has standardized the "Multidimensional Anger Inventory" a scale that is claimed to be sensitive to the multidimensional nature of the anger construct. Its test-retest reliability is 0.75 and alpha reliability coefficients range from 0.84 and 0.89.

A highly competent tool named "Anger Expression Scale" (AX Scale) was developed by Spielberger et al. (1985). It is a
dichotomous self-report rating scale to assess anger expression as a personality trait. While formulating the definition of AX scale, it was deemed essential to distinguish between anger as an emotional state (S-Anger), and how often angry feelings were experienced (T-Anger) and the behavior that people engage in when they feel angry or furious. AX scale assesses how often subjects respond in a particular manner, rather than how they respond to a particular situation, scores on this scale provide an index of the frequency that an individual expresses or suppresses anger across a variety of anger providing situations that are typically encountered in daily life. AX Scale comprises 24 items and yields four different scores. The three AX subscales assess individual differences in the tendency to express anger toward other people or objects in the environment (AX/Out), experience but hold in (suppress) angry feelings (AX/In), control and/or resist the experience and expression of anger (AX/Con) and the total score (AX/Ex). The analysis of the AX-scores of students classified as "anger-in" and "anger-out" on the basis of modified Harburg procedure (Johnson, 1984) provides evidence of the concurrent and construct validity of the AX Scale and its subscales. Significant gender effects were found for the AX/EX and the AX/In scores; females had somewhat higher AX/EX total anger-expression scores than males and somewhat lower scores on the AX/In subscale. Further evidence of convergent and divergent validity of the AX and its subscales was found (Johnson, 1984), which reported its correlation with other anger and
personality measures. The AX/In and AX/Out subscales correlated more highly with STPI anger measures than did the AX/EX total anger expression scores. A small but significantly high correlations of the AX subscales with state and trait anxiety was also found.

Siegel (1986) developed a multidimensional Anger Inventory (MAI) and hypothesized that MAI would include scales reflective of the following dimensions of anger: frequency, duration magnitude, mood of expression, hostile outlook and range of anger-eliciting situations. It was observed that mode of anger expression was best described by two dimensions labelled anger-in and anger-out. Psychometric analysis revealed that it possessed adequate test-retest reliability ($r = 0.75$) and high internal consistency (alpha = .84 and .89 for two samples).

State-Trait Anger Expression Inventory (STAXI) developed by Spielberger and his associates (Spielberger, C.D., 1988; Spielberger C.D. et al. 1983, 1985), provides concise measures of the experience and expression of anger. The STAXI was developed for two primary reasons (i) to provide a method of assessing components of anger that could be used for detailed evaluations of normal and abnormal personality and (ii) to provide a means measuring the contributions of various components of anger to the development of medical conditions, including hypertension, coronary heart disease and cancer.

The experience of anger, as measured by the STAXI, is conceptualized as having two major components—state and trait
anger. These components have been defined earlier. In addition to these two components, scores on AX/In, AX/out and AX/EX are also provided by 44-items of STAXI. The names, the number of items and the components of anger assessed by each scale are described as follows:

**State Anger (S-Anger)**

A 10-item scale which measures the intensity of angry feelings at a particular time.

**Trait Anger (T-Anger)**

A 10-item scale which measures individual differences in the disposition to experience anger. The T-Anger scale has two subscales.

**Angry Temperament (T-Anger/T)**

A 4-item test T-Anger subscale which measures a general propensity to experience and express anger without specific provocation.

**Angry Reaction (T-Anger/R)**

A 4-item T-Anger subscale which measures individual differences in the disposition to express anger when criticized or treated unfairly by other individuals.

**Anger-in (AX/In)**

An 8-item anger expression scale which measures the frequency with which angry feelings are held in or suppressed.
**Anger-Out (AX/Out)**

An 8-item anger expression scale which measures how often an individual expresses anger toward other people or objects in the environment.

**Anger-Control (AX/Con)**

An 8-item scale which measures the frequency with which an individual attempts to control the expression of anger.

**Anger-Expression (AX/Ex)**

A research scale based on the responses of the 24-items of the AX/In, AX/Out and AX/Con scales which provides a general index of the frequency that anger is expressed regardless of the direction of expression.

In responding to each of the 44 STAXI items, individuals rate themselves on four-point scales that assess either the intensity of their angry feelings or the frequency that anger is experienced, expressed, suppressed or controlled.

Significant correlation of the T-Anger scale with three hostility measures e.g., Buss-Durkee Hostility Inventory (BDHI; 1957) and the Hostility (Ho; Cook & Medley, 1954) and overt Hostility (Ho; Schultz, 1954) scales of Minnesota Multiphasic Personality Inventory was found across samples for both males and females. This provides a strong concurrent validity of the T-Anger scale as a measure of anger. The moderate correlations between the T-Anger scale and the
T-Anxiety and EPQ. Neuroticism scales are consistent with clinical observations and theory that individuals high in neuroticism and trait anxiety frequently experience angry feelings that they cannot readily express. Low to moderate correlations that were found between the S-Anger scale and the T-Anxiety and EPQ Neuroticism and Psychotism scales indicate that individuals with psychopathological personality traits experience more intense angry feelings than emotionally stable people.

The Hindi language version of Anger Expression AX Scale (AX/In, AX/Out, and AX/Con) and of the total STAXI have been developed by Krishna (1988) and Rana (1990) respectively. They have provided ample evidence of the cross-language equivalence (English-Hindi) of these measures in terms of comparable means, standard deviation, inter-correlations, item-remainder correlations, alpha reliability, etc.