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COPING WITH STRESS: AN ANALYSIS OF THE CORRELATION BETWEEN COGNITIVE APPRAISAL VARIABLES AND STRESS REACTION MEASURES

The Ohio State University

PH.D. 1980

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COPING WITH STRESS: AN ANALYSIS OF THE CORRELATION
BETWEEN COGNITIVE APPRAISAL VARIABLES
AND STRESS REACTION MEASURES

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By
Jane Carter Bartlett, B.A., M.A.

* * * * *
The Ohio State University
1980

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ACKNOWLEDGEMENTS

Learning is finding out what you already know.
Doing is demonstrating that you know it.

My thanks are given to those people who helped with this learning experience. Barbara Smith's expertise in preparing and typing manuscripts was a valuable asset. The stimulating comments and probing questions of my committee members, Dr. Joseph Quaranta and Dr. Lyle Schmidt, assisted in the refinement of the final copy. My committee chairman, Dr. James V. Wigtil, kept me on task and on time. To my friend and colleague, Dr. J. Melvin Witmer, I offer special appreciation for introducing me to his research and for encouraging me to develop my own approach to it.

The bond that links your true family is not one of blood, but of respect and joy in each other's life.

Thanks, also, to the friends - part of my larger family - whom I respect and in whose lives I find joy. Irene, Mike, Marlene, Dorothy, Mel and Dick gave me their love and encouragement at a time when I needed it.

Finally, I express my gratitude to my parents, Kay and Tom Carter, who were always confident that I could reach my goals, and to my children, Diana, Elisabeth and Karen, who are precious beyond words. Their love nourishes and sustains me.

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PUBLICATIONS


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CHAPTER I

INTRODUCTION

Background to the Problem

The second issue of the Journal of Human Stress (1975), the only periodical devoted exclusively to the publication of articles on the subject of stress, carries an article by Hans Selye, a pioneer in the field, entitled "Confusion and Controversy in the Stress Field." The confusion, according to Selye, centers in the definition of terms used by individual researchers and theorists in a new but exceedingly rapid-growing field of study. His article is written in response to an earlier one by Mason (1975) who proposes that the confusion is primarily due to the fact that stress has been defined in so many ways that the only reason it is still in use is because of its strong intuitive appeal. A brief review of that controversy over various conceptualizations of stress as stimulus, response and transactional process clarifies this study's focus on the process of cognitive appraisal.

Research in the field of stress has a rather short history. With the exception of Cannon (1932), who laid groundwork on which some present-day research is based, stress research can be traced from the initial work of Selye in the 1950's. Selye (1956), working with infra-human subjects, initially defined stress as the non-specific response of the body to any demand made on it. That response, over time, results in what he terms the General Adaptation Syndrome. He points out that stress is characterized by an alarm, resistance and extinction.
phase, and results in enlarged adrenal cortex, shrinking lymph nodes and an increase in white blood cells. Faced with evidence that the same stress may have differing effects, Selye (1974) later allows for a "conditioning factor" which may enhance or inhibit the effects of a stressor. Indeed, he concedes that stress may very well depend on "how you take it."

That stress is a stimulus, an external or environmental event, is the contention of Holmes and his colleagues. They define stress in terms of natural disasters such as earthquakes, tornadoes and fires, or human problems like war, racial tension or relocation, and direct their research toward a study of the effects of those stresses on physical well-being. The Social Readjustment Rating Scale (Holmes and Rahe, 1967) measures the effects of various stressful events; for example, divorce, job change, holidays, etc., on individuals. Events are weighted according to their hypothesized stressful effects. High scores are correlated with subsequent physical problems such as heart attacks and ulcers. Other researchers (Rabkin and Streuning, 1976; Mechanic, 1974a) take issue with the direct, causal relationship between stimulus and response implied in this life change research model, and propose that the way in which events are viewed by the individual must be taken into account.

The researcher who has been most active in supporting the concept of stress as a transactional process between the external event and the individual's response to it is Richard Lazarus. In a stream of research marked by his first major publication in 1966, Lazarus has consistently found support for the theory that higher cortical centers play a major part in stress. He contends that a
study of the on-going appraisal of external events as they may pose a threat to the individual's motives or values is essential to understanding the nature of stress. Appraisal is accomplished in two stages, according to Lazarus (1966): primary appraisal, which is the determination of the effect that the perceived threat will have on the individual; and secondary appraisal, which is the individual's estimate of his/her resources for meeting and managing that potential threat.

This view is also held by others. Arnold (1960) postulates a physiological "estimative system." That is, persons are guided to action by their estimate of how things affect them. The estimation or appraisal may be intuitive or voluntary, but in either case both personality factors and physiology are involved in the process. Levi (1971) conceptualizes stress as a constant interaction between the environmental stimuli and the individual's processing system, consisting of a psychobiological program, the mechanism for dealing with the environment and the possible precursors of illness. This transactional process determines the individual's quality of life. Finally, Antonovsky (1974) suggests that a set of mediating variables operate between life events and one's health. He calls them "resistance resources," defined as the power which can be applied by an individual to resolve tension.

The foregoing brief review points to the need for developing a working understanding of stress which encompasses both significant research findings and useful theoretical opinion. The following summary forms the basis for understanding stress on which the present research study is built.
First, it is proposed that stress is characterized as a decrease in the quality of life (Levi and Anderson, 1975). Whether that decrease is related to an overabundance of stimuli, as in crowding and disease, or to an absence of stimuli, as in deprivation, is immaterial. Of major importance are the reactions: disturbed affect, physiological change, and decreased adequacy of cognitive functioning (Lazarus, 1966). Furthermore, while it is acknowledged that those reactions are common to all humans it is not suggested that a direct connection exists between, for example, marital discord and peptic ulcers (Selye, 1977).

While there are some typical or modal responses to stress that most of us have, each individual must be assessed for the unique reactions as well as the typical ones. Each person has a distinct pattern of responses that characterizes his or her stress profile (Witmer and Cottingham, 1979, unpublished).

Thus, both generalized and individual stress reactions result from involvement in the stress transaction, regardless of the nature of the stressor.

Finally, it is emphasized that although research focusing on specific aspects of the phenomenon from highly individualistic frames of reference has resulted in broadening the knowledge base of the field of stress, most recent literature supports the notion that generalizations regarding the cause of specific reactions or the effects of specific stressors cannot safely be made. The unique interaction of individual and environment is acknowledged as the prime determinant of both the engagement of coping behaviors and the occurrence of stress responses.
A life event becomes stressful only when it is perceived as such by the implicated person or group as a result of awareness of unavailability or depletion of coping resources. Accordingly, an event becomes stressful when either magnitude of change or undesirability evoked is beyond the competence of the coping person. By virtue of choosing to talk in terms of stressful life events (in these terms) we become obliged to refocus our attention on: (1) the individual's subjective perception of the amount of stressfulness contained in an event or situation which is determined by his or her evaluation of amount of available coping resources; (2) perhaps more importantly, individual patterns of behavioral and psychological reactions in times of confrontation with "stressful" stimuli and their personality and situational determinants (Chan, 1977).

Subjective perception, therefore, becomes a legitimate and fruitful subject for the study of stress.

In a detailed review of the literature in which he addresses the topics of stressors, stress appraisal, coping and stress outcomes, Lumsden (1975) cites several studies on the mediating factors in the perception and appraisal of stress. Factors such as age, sex, marital status, family structure and functioning, role-flexibility are cited as influencing appraisal. Unfortunately, no mention is made of cognitions as possible mediating factors. It is to a study of cognitive factors in stress appraisal that this research is addressed.

Theoretical and practical support for the concept of cognitive appraisal as mediating between perceived stress and stress reaction is given by semantic therapists such as Frank (1961), Ellis (1962), Beck (1970) and Meichenbaum (1975). Espousing the view that human psychological suffering and maladaptive behavior are the result of faulty belief systems and negative appraisal of events, cognitive theorists propose that situational appraisal results from self-talk, engaged in on the basis of a personal belief system about self and the
world. In other words, it is not stressors themselves that determine whether or not individuals exhibit stress reactions, but rather what they think and tell themselves about those stressors.

**Need for the Study**

Regardless of how stress is defined, as stimulus, response or transaction, its effects can be debilitating. Many persons suffer intensely as a result of their inability to cope successfully with stress. Some popular literature estimates that up to eighty percent of persons who seek medical attention are later diagnosed as suffering from primarily stress-related complaints. For example, such disabilities as hypertension, migraine, arthritis and respiratory disease have been determined to be stress related (Pelletier, 1977). Anxiety is also thought to be the result of ineffective coping techniques and is generally a concomitant of physical illness (Grinker, 1966).

And yet, many people face potentially stressful situations daily and do not suffer negative consequences. Research suggests that certain characteristic beliefs and cognitive patterns may differentiate between those who cope and those who do not cope successfully with both daily commonplace stressors (Lazarus, 1977) and with specific critical life incidents (Mechanic, 1962). More information is needed about the cognitive variables which are a part of the appraisal process and which, as a result, contribute to either benign reaction or symptomatic stress reactions.

Once it is understood that individuals engage in cognitive appraisal of events in terms of the potentially stressful effect those
events may have, intervention can be employed at the cognitive level to help people manage stressors. Furthermore, an understanding of the cluster of attitudes and beliefs which comprise these cognitions enables greater specificity in the development of programs and procedures aimed at strengthening a person's ability to cope. Such a specific program was developed by Beck and Rush (1975) to treat anxiety patients with a cognitive intervention model.

Purpose of the Study

It is the purpose of this study to determine the relationship between specific cognitive appraisal variables in the stress transaction and two measures of stress reaction, trait anxiety and physical symptomatology. In order to accomplish that purpose, certain questions are posed.

Research Questions

1. Are the following personal beliefs and attitudes as measured by the Stress Questionnaire (SQ I) (Witmer, 1979) characteristic of persons who cope successfully? That is, are they negatively correlated with high levels of stress reaction?
   a. being optimistic
   b. feeling genuine
   c. having stable and lasting values
   d. believing that life has meaning and direction
   e. being confident in one's ability to cope
   f. perceiving control over events
   g. not feeling "rushed"
2. Is irrational thinking as measured by the Common Beliefs Survey III (CBS III) (Bessai, 1976) characteristic of persons who do not cope successfully? Specifically, are the following beliefs positively correlated with high levels of stress reactions?

a. importance of the past in determining the present
b. a proneness to blame
c. a tendency toward self-downing
d. the need for others' approval to approve of oneself
e. a need to be perfect in all ways
f. a belief that one is not in control of one's emotions

3. What linear combination of the preceding cognitive appraisal variables is most highly correlated with stress reaction measures of trait anxiety and physical symptoms?

**Definition of Terms**

1. **Stress** - Stress is

   ...a generic term for the whole area of problems that include the stimulus producing stress reactions, the reactions themselves, and the various intervening processes. Thus, we can speak of the field of stress, and mean the physiological, sociological, and psychological phenomena and their respective concepts. (Stress is) a collective term for an area of study (Lazarus, in Monat and Lazarus, 1977, p. 2, 3).

2. **Stressor** - Using the work of Levi (1967) as a benchmark, a stressor is defined in terms of external forces, dangers, or strains requiring adjustment by the body. This may include physical stressors such as hunger, bacteria and polluted air, or psychological stressors such as a demanding employer, financial insecurity, or an unhappy marriage. For the purpose of this study, a stressor is the implied
agent which evokes a stress reaction. No specific stressor is utilized in accordance with Dohrenwend's (1974) contention that the observation of a stress reaction is sufficient indication that a stimulus or event has been appraised by an individual as a stressor.

3. **Stress reaction** - Although both reaction and response appear in the literature with equal frequency, reaction is used in preference to stress response in order to achieve consistency in definitions. Lazarus (1966) employs the term stress reaction to describe the phenomenon. Stress reactions may be treated in four categories: reports of disturbed affect, motor-behavioral reactions, changes in the adequacy of cognitive function, and physiological changes. For the purpose of this study, stress reactions will be physiological symptoms as measured by frequency and intensity of physical symptoms on the Physical Frequency and Intensity Checklist, and reports of disturbed affect as measured by the trait anxiety scale on the Self-Evaluation Questionnaire (STAI). Trait anxiety as defined in the STAI Manual (Spielberger, Gorsuch and Lushene, 1970) "refers to relatively stable individual differences in anxiety proneness...to respond to situations perceived as threatening with elevations in A-state intensity" (p. 3). The authors suggest that trait anxiety involves "residues of past experience that predispose an individual both to view the world in a particular way and to manifest 'object-consistent'response tendencies" (p. 3).

4. **Appraisal** - This is a process of judging and evaluating self and situation when presented with a stressor, and according to Arnold (1960) is an intermediate step between perception and emotion. Appraisal is partly a function of the situation and partly a function
of the belief system, cognitive style, and personal disposition of the individual, according to Lazarus (1960). He emphasized that either irrational or irrational coping may result from the appraisal process. In his judgment, appraisal, or "mediating cognitive activity" (p. 261), has two component parts, primary appraisal and secondary appraisal. In primary appraisal, situation, belief system, and cognitive style interplay as the individual assesses the balance of power between him/herself and the stressor. The personal beliefs and attitudes which are measured by the SQ I and the irrational beliefs contained in the CBS III are measures of the belief system and cognitive style which interact with the situation. Secondary appraisal, which involves evaluating the consequences of alternative coping activities, includes the personal disposition of the individual as mentioned above.

5. **Cognitive appraisal variables** - These variables are cognitions which lead to the appraisal of an external event or situation as either benign or threatening and which operate in primary appraisal. They are the personal beliefs and attitudes measured by the SQ I and the rational or irrational thoughts as measured by the CBS III. Girodo (1975) uses the term "self-talk" in describing the process of employing the variables in situational appraisal.

6. **Coping** - In coping, an individual engages in action tendencies or problem-solving efforts directed toward managing situational demands highly relevant to one's welfare or taxing one's adaptive resources (Lazarus, 1974). The emphasis is on the employment of nonroutine efforts. Evidence of successful coping strategies is the relative absence of stress reactions such as anxiety as measured
by the STAI (Spielberger, Gorsuch and Lushene, 1970), and physical
symptoms as measured by the Physical Frequency and Intensity Checklist
(PFIC) (Witmer, 1977).

Limitations of the Study

The following limitations should be kept in mind in interpreting the results of this study.

1. Data are self-report, which are considered by many researchers to be suspect. A person's subjective descriptions of him/herself may be colored by an attempt to "look good."

2. Stress reactions in the study are limited to two measures. Stress reactions may be expressed in ways other than those measured.

3. All instruments were not administered under similar circumstances. Some subjects completed instruments during seminar sessions, while other subjects completed instruments in their homes or work settings.

4. Validity and reliability has not been adequately established for the CBS III, the SQ I, and the PFIC. Results of the study should be examined in view of that limitation.
CHAPTER II

REVIEW OF THE LITERATURE AND RELATED RESEARCH

Introduction

This chapter will be devoted to a consideration of stress as defined in this study, with major focus on the appraisal process as it functions in the anticipatory period. The importance of an individual's perception of a potentially stressful event, his/her self-assessment in relation to it, the possible reactions to that transaction, and the cognitions that interact will be addressed.

First, the appraisal process will be discussed as it relates to perceived threat. Next, two types of cognitive appraisal variables will be presented: (1) personal beliefs and attitudes, and (2) generalized rational/irrational thoughts. The personal beliefs and attitudes include expressions of optimism, harmony, self-efficacy and self-pace. The generalized rational/irrational cognitions based on the Rational Emotive theory of Albert Ellis (1962) are proposed as a second group of variables. Lastly, a rationale will be given for the use of anxiety and physical symptomatology as measures of the stress reaction.

The Appraisal Process

Not only in the area of stress research, but in many other areas of psychological and sociological research, data support the statement that "...knowledge of the properties of the stimulus can at
best only partially predict the nature and direction of the response" (Chan, 1977, p. 90). Further, "the principle that behavior represents the interaction of the individual and the environmental situation implies that the total variance of any response can be accounted for only in part by individual differences in characteristics of participating persons" (Sells, 1963, p. 3). Therefore, "if anything has been learned in the study of stressful life events it is that what is important for their consequences is the subjective perception of the event rather than its objective character" (Antonovsky, 1974, p. 2).

Evidence points to the fact that stress is not a simple S-R relationship but rather is a complex interaction between individuals and their environments involving higher cognitive processes.

Cognitive does not imply awareness, good reality testing, or adaptiveness. It only implies that thought processes are involved, not the kind or quality of the thought. What is meant is that beliefs, expectations, perceptions and their motivations underlie how a threat stimulus is reacted to (Lazarus, 1967, p. 168).

In summary, the major components of the appraisal process are the situation, the individual and the interaction between them.

Long before the appraisal process began to be systematically studied, Grinker and Speigel (1945) recognized its importance in their research with men in combat. They studied the link between phenomena and cognition in relationship to stress response by observing soldiers over extended periods of time. After experiencing repeated "near misses," Grinker and Speigel's subjects altered their perception of impending battles. Statements regarding anticipated events which were highly similar to previous events changed from "it can't happen to me" appraisals to "it's my time to get it." Neither the individuals nor
the events had changed, but cognitions had, with the result that severe anxiety was the norm among the troops.

Arnold (1960) refined that cognitive-phenomenological consideration of appraisal. Her theory of emotion postulated that perception alone is not sufficient to evoke an emotional stress reaction, but that judgement or appraisal is also essential. She described emotional reactions as "the felt tendency toward anything intuitively appraised as good (beneficial) or away from anything intuitively appraised as bad (harmful) (p. 182). That tendency is an "estimative system" in operation. Arnold made the point that persons are guided by and react to events in light of an estimation of how events may affect them. The process is highly individualistic and may be both intuitive (evaluating, imaginative) or reflective (voluntary, seeking).

The appraisal process in stress has been most thoroughly explored by Richard Lazarus and his colleagues at the University of California, Berkeley. In his first major work, Psychological Stress and the Coping Process (1966), Lazarus developed his views in detail. In that book he proposed that an explanation of the occurrence of a stress response lies not in the event alone, nor solely in the person, but in the person's perception of the event and his or her subsequent appraisal of its effects. Stress appraisal occurs in two consecutive but overlapping stages. First, a stressor is located and evaluated for possible danger to the self. That is, its degree of potential harm is assessed. This is "primary appraisal." Next, the individual's own resources are evaluated and a judgment is made as to the relative balance of power. This is called "secondary appraisal."
It is important to note that stimuli are only appraised as stressors when they include an element of threat. For example, threat includes impending danger, motive-thwarting or cues to possible harm to one's self-esteem, and is clearly distinguishable from anxiety, which is a stress reaction. Threat has two major properties: it is anticipatory, occurring prior to the onset on the stressor; and it involves cognition, in which assessment is made of relative strengths and weakness relative to the stressor.

Three factors merit emphasis. First, appraisal is conceptualized as an anticipatory phenomenon, not a confrontive one. Second, appraisal is a cognitive process. Third, threat need not have objective reality or intensity, for the degree of threat depends on the extent to which the self is subjectively appraised as adequate.

Neufeld (1975) investigated stress appraisal as a function of four components: (1) the degree of perceived aversiveness of the stimuli, (2) the appraisal of resources to deal with it, (3) the source of those resources, and (4) the interactive effects of the experimental manipulation. Investigating Lazarus' proposal that stress reactions vary as a ratio of the first two factors above, Neufeld extrapolated that a difference in stress reaction might occur if resources were studied in terms of their source, personal or environmental. He found that stress reactions were less severe when subjects appraised resources as being internal or personal, than when those resources were imposed from the environment. The State-Trait Anxiety Inventory given pre- and post-test showed less increment in state anxiety for persons appraising themselves as having personal
resources. The importance of positive self-appraisal as a stress-reducing factor was supported.

Considerable research has focused on manipulating the appraisal process in order to study the cognitions which are involved in it. Results indicate three factors to be important determinants in the perception of threat: temporal uncertainty, ambiguity, and activity.

The first noteworthy study on the relationship between temporal uncertainty and the perception of threat was conducted by Monat, Averill and Lazarus (1972). Using a sophisticated research design involving anticipatory shock and degrees of uncertainty ranging from 100 percent time known to 100 percent time unknown, they found initial higher levels of anxiety under conditions of temporal uncertainty (100 percent time unknown) although physiological reactions in that condition decreased with repeated trials. Their conclusion was that under 100 percent time unknown conditions persons initially were highly anxious, but continued lack of control eventually resigned them to a position of helplessness, inability to take action on their own behalf. Conversely, persons in a 100 percent time known condition were constantly aroused. Their vigilance or cognitive concentration on the impending danger, coupled with a lack of power to prevent it, increased stress response. When wait time is 100 percent known, subjects become increasingly stressed as the impending danger nears and despite repeated trials, the stress reaction does not abate. Therefore, although temporal uncertainty was initially appraised by subjects as being most stressful, it encouraged a cognitive coping pattern which
results in lowered physiological stress reaction, whereas temporal
certainty increased stress reactions. A second and equally important
finding of this study was that shock need not be administered in order
to induce a stress reaction. Threat of shock is sufficient in itself,
for stress reactions occur as frequently in the anticipatory period as
they do post-stressor. This finding had been noted in earlier studies
(Shannon and Isbell, 1963; Epstein, 1967) and is the focus of a dis­
cussion of the role of anticipation in stress in a later work by
Lazarus (1977).

Gaines, Smith and Skolnik (1977) investigated the question of
whether or not the cognitions involved in evaluating the stressful
effects of event uncertainty might be related to the cognitive style
of field dependence/independence. A group of twenty-four female
college students were categorized as field dependent or independent on
the basis of a rod and frame test. In a subsequent shock test, the
researchers found greater physiological stress reaction as measured by
heart rate in field independent subjects during conditions of temporal
certainty and proposed the reaction was due to subjects' unabated
attempts to master the task. In addition, during conditions of
temporal uncertainty field independent subjects had significantly
lower stress reactions, indicating that when they knew they had no
control they remained passive. Conversely, field dependent subjects
remained most vigilant under conditions of temporal uncertainty,
indicating that they expected to be shocked more frequently and ap­
praised the situation as more threatening than field independent
subjects.
Monat (1976) found that individual differences under conditions of temporal uncertainty become more evident with longer periods of time intervening between shock trials. He proposed that subjects require time and experience in dealing with a stressor in order to develop competence. This theory supports the notion that in everyday stress the cognitive coping styles and strategies which have developed over time in conjunction with attitudes, beliefs, and self-statements are engaged in, as Arnold (1960) says, "intuitively" in the face of stressors.

A second factor operating in the appraisal of threat is ambiguity. Theoretically, if an individual receives a cue that a situation holds potential danger but the specific agent of harm cannot be located, threat is increased because no action can be taken against an agent which cannot be identified. Also, if an individual is predisposed to anticipate threat, many non-threatening situations may be misperceived as having objective danger. Shalit (1977) in a review of the literature found three factors operating when situations are appraised as ambiguous. The first is differentiation, or the number of possible interpretations for any given stressor. The second is articulation, that is, how clearly the interpretations of a stressful situation can be differentiated from one another. The third is loading, or the perceived degree of positive or negative affect in the situation. Interpreting the results of a broad range of stress research studies, Shalit found increased ambiguity to be negatively correlated with successful cognitive coping. He suggested that the effects of situational ambiguity on the ability to appraise a situation to be of primary importance among factors determining
potential for coping. He links his findings to Lazarus, Averill and Opton's (1974) three-stage appraisal thus:

1. Primary appraisal: establishing the emotional loading of the situation, whether positive or negative.

2. Secondary appraisal: establishing the range of coping alternatives available (in our terms - differentiation and articulation).

3. Reappraisal: on the basis of feedback from the first two stages.

We would thus suggest that the ambiguity factor is the first in the hierarchy of situational variables, occurring whenever appraisal does. Therefore, it also has the highest threat potential (p. 36).

Activity is the final determinant of the degree of appraised threat in stress. In the two previous sections, temporal uncertainty and ambiguity experiments were geared to assessing the subjects' ability to use intrapsychic coping strategies with potential stressors. In this section, direct action is discussed. A review of the literature by Gal and Lazarus (1975) indicates that activity or direct action is a powerful tool for reducing stress reactions. They say:

First, a clear and plausible definition of "activity" in this context is required. By "activity" we mean overt, motoric action taken by the individual while he is anticipating a threatening event. "Passivity" on the other hand, is the absence (or unavailability) of such motoric activity during anticipation (p. 4-5).

Citing several studies of soldiers under combat stress, whose stress reactions were measured by corticosteroid levels in the urine and by subjective report of affect, they found a generally greater physiological reaction on the part of the active soldiers and a greater psychological reaction on the part of those who were passive. However, they propose that hormonal levels are the result of activity per se,
and anxiety is the true stress reaction. They conclude:

Although active roles in stress situations do appear to enhance physiological arousal, these roles seem to be preferred by the participants and to be less anxiety-producing than passive roles in the same situation (p. 11).

Whether the activity is related to active coping with the potential stressor or whether it is employed as a distractor has also been investigated. Surgical patients who are given information to study and activities to engage in prior to surgery generally cope more successfully (Katz et al, 1977). On the other hand, such distractors as waiting, knitting and sewing proved effective in reducing stress in parents of children with terminal neoplastic disease (Chodoff, Friedman and Hamburg, 1964).

Two positive explanations are possible for the effectiveness of activity in reducing stress in these instances. First, activity directed toward the stressor increases one's feeling of control. Janis (1962) has described preparatory activity as the "work of worrying" and has found it exceedingly effective in preparing for impending disaster. Second, activity that is diversionary discharges energy and underscores the utility of the "fight or flight" approach proposed by Cannon (1932).

The foregoing discussion emphasizes the fact that when the meaning of an event is neither clearly definable nor predictable, and when it affords no opportunity in which to practice skills needed to meet it effectively, the balance of power is perceived to be in favor of the event rather than the individual and threat is enhanced. In those instances a second process, termed situational reappraisal, may
follow. The individual may attempt to redefine the situation to his or her advantage. If reappraisal is not successful or if the individual typically devalues him or herself in the appraisal process, stress reactions likely will result.

Certain questions can be raised on the basis of the foregoing. What operates to make one person experience a given situation as an opportunity for self-enhancement and growth and causes another to be debilitated? What are the crucial variables operating in the interaction between person and situation that results in those different responses?

**Relationship of Personal Beliefs and Attitudes to Appraisal**

The suggestion (Lazarus, 1966) that an individual's generalized beliefs and attitudes about self and environment determine how information will be used in appraisal has strong theoretical support. Kelley's (1955) theory of personal constructs and Frank's (1961) assumptive world both proposed that persons view events in terms of subjective beliefs about those events and evaluate incidents in light of their personal constructs or assumptions. For example, a basic attitude of trust (Erikson, 1963) or hope (Jourard, 1964) underlies a tendency to make positive appraisals of external events. On the other hand, Frankl (1973) pointed out that careless attitudes toward, or disinterest in, the value of one's own existence may cause an individual to sicken and die.

May (1979) suggested that people create their own worlds by forming suppositions and seeking consensual validation for them.
Reality is therefore unique to each individual, results from individual beliefs and attitudes, and is the relationship between the individual and his or her external world.

Some research has attempted to discover how attitudes toward stressors influence individuals appraisal and coping strategies. Findings indicate that most persons assume one of two general positions (Lazarus, Averill and Opton, 1974). They either deal with a stressor directly and problem-solve behaviorally, or they cope intra-psychically employing cognitive manipulation. Janis (1962) further delineates intrapsychic attitudes of vigilance (sensitzers) and repression (avoiders) based on cognitive styles. Intrapsychic coping in the vigilant manner involves attending to the stressor, seeking information about it and appraising one's capacity to cope with it. Intrapsychic avoiding involves distracting self-talk which is directed away from coping with the stressor.

"Work of worrying" studies (Janis and Mann, 1976) over the years reveal that vigilance is apparently linked to a positive attitude toward, and appraisal of, one's ability to cope. Furthermore, studies of surgical patients (Miechenbaum, Turk and Burstein, 1975; Langer, Janis and Wolfer, 1975; Pancheri et al, 1978) show that self-talk aimed at developing positive, on-task attitudes results in less post-operative stress reactions. Chiroboga and Dean (1978) in a life change events study found not change itself but a negative preoccupation with it to be associated with subsequent poor adjustment. The attitude determined the approval.

It is important to note that attitudes and beliefs as they are here discussed are not equated with static personality attributes.
The paradigm employed is that attitudes, beliefs and values are a dynamic underlay for cognition. Neither is stress a static state but, again, a dynamic interplay over time of individual adjustment to the environment (Wild and Hanes, 1976). In support of the dynamic theory of stress, Girodo (1977) found mechanical repetition of coping self-statements ineffective in reducing stress except in instances when they were coupled with an opportunity for on-going situational appraisal.

These attitudes and underlying appraisal styles are formed early in life. Murphy (1962) noted that even in childhood individual patterns of belief systems discriminated between children's coping style. Certain children approached challenge with enthusiasm, believing that they were capable; other children exhibited anxiety, doubting their ability; still others ignored threatening cues, insulating themselves against stressors. Studies of effective adults (Erikson, 1963; Maslow, 1954; Grinker, 1962) also indicate that attitudes differentiate between general positive and negative appraisals. Smith (1968) reported on the results of a longitudinal study of Peace Corps volunteers:

There is a cluster of attitudes which bear upon the extent to which a person is oriented to make the most of his opportunities in the world, upon the likelihood that the interactive circles of causation in which he involves himself will be benign, not vicious (p. 281).

That is, there seems to be a core of interrelated personal attitudes which interact with the environment in a spiral manner, positive begetting positive and resulting in the individual coming to see him or herself as competent to deal with the environment.
In the present study, eight of the personal beliefs and attitudes measured by the Stress Questionnaire (Witmer, 1979) are transformed by the BMD statistical package (1977) into four major cognitive appraisal variables as explained in Chapter III, Pilot Data Analysis section. A review of theoretical and experimental literature indicates that those four variables—optimism, harmony, self-efficacy and pace—may be characteristic of persons who make positive appraisals and cope successfully with stress.

Optimism. In a recent book entitled Optimism: the Biology of Hope (Tiger, 1979) an anthropologist proposed that a positive disposition toward life not only has a genetic foundation, but is also central to the evolution of modern man and woman. Citing such widely diverse examples of optimistic behavior as visiting Mecca, planning to have a baby, and praying for the death of an enemy, he expressed the belief that optimism is always a subjective expression of one's purpose for the future which serves to guide one's destiny. The belief that optimism is a positive, anticipatory statement about the future and one's place in it is central to the present study. Furthermore, the suggested biological basis for optimism supports contemporary findings which link catecholomine levels to neurotic depression, an affect antithetical to hope. Finally, Tiger's proposal lends credence to both Lazarus' (1979) argument that human beings possess a seemingly natural inclination to engage in positive denial as a health-producing
technique, as well as to the results of a nationwide happiness study in which 70 percent of 100,000 subjects reported themselves as optimistic (Freedman, 1978).

Optimism is not only natural, it is healthy. In a longitudinal study of "garden variety" or "daily hassle" stress research, Lazarus (1979) pointed out that competent copers employ a wide range of strategies, one of which is positive denial. Proposing that the optimistic belief in a better tomorrow is not pathological, but palliative, he states:

Illusion can sometimes allow hope, which is healthy... Life is ambiguous. Many of the beliefs we have about the world around us - about justice, about our integrity, about the attitudes of those around us, about our own future - are based on, at best, ambiguous information. One can maintain illusions about those that have a positive aura without necessarily distorting reality. Such illusions are not pathological, hope is not the same as denial (p. 48).

Studies of crises conditions provide support for the hypothesis that optimism correlates with the capacity to deal effectively with stress. In two reports based on psychiatric interviews with and clinical diagnoses of the survivors of the "Pueblo Incident" (Ford, 1975; Ford and Spaulding, 1973) faith in their ultimate release was reported as the best discriminator between men who were evaluated as effective copers and those who, after release, were diagnosed as schizoid. Coping was defined in this study as (1) low anxiety and depression, (2) contributing to group support, and (3) realistic resistance to captor's demands.

Dimsdale (1974) interviewed survivors of Nazi concentration camps, asking the question "How did anyone keep going and survive such
stress?" (p. 792). Results indicate that "differential focus on the good" a figure-ground technique, and hope - active and passive - were among the most frequently cited techniques employed by survivors who were classified as healthy and emotionally stable. A vignette of Sara, 20 years old when she was taken to Auschwitz, is detailed.

I had a belief...I was convinced that all the wrong things had to change and we would be free...In Auschwitz I saw my husband at a distance, and I shouted to him that we would meet again, never to give up. I picked the good from the bad situation. In Auschwitz I was beaten many times, the shooting, the smell, the electric fence, but I knew to survive I had to believe, believe that such a bad thing cannot last.

Today, she says: It is just like in the Middle East today - you must have hope; I hope for a solution, a happy solution, that they can live together side by side (p. 795).

Finally, one fact emerging from recent studies of the crises of terminal illness is that optimism plays a central part in the afflicted patient's ability to cope. Weisman (1972) proposed that "patients facing imminent death are usually far less hopeless than are psychiatric patients" (p. 20).

In Anatomy of an Illness, Norman Cousins (1979) not only detailed the central role that sustaining a positive attitude of hope played in his recovery from a generally fatal disease, but also quotes physicians who themselves have witnessed similar recoveries. Dr. Bernard Lown (Modern Medicine, Sept. 30, 1978) is reported as saying:

If you look at the total spectrum, 40 percent of patients who have heart attacks die. So when I arrive I say to the patient, "Yes, you have had a heart attack, but you are going to recover." And I'm very dogmatic about it even though the attack may be so massive that I have great trepidation about the prognosis (p. 135-136).
The message of Cousin's first-person single case study was that although medication and hospitalization are not without merit, a positive, hopeful attitude toward one's ultimate recovery is the single most powerful healing force.

It all began, I said, when I decided that some experts don't really know enough to make a pronouncement of doom on a human being. And I said I hoped they would be careful about what they said to others; they might be believed and that would be the beginning of the end (p. 160).

Work with cancer patients (Simonton and Simonton, 1974) showed remission to be positively correlated with a hopeful attitude and not with the severity of the illness. They stated three important factors need to be recognized in coping with cancer--the belief system of the patient, the belief system of the family and meaningful other persons, and the belief system of the physician. All must be hopeful; their visualizations must be positive. The cases of two middle-aged lung cancer patients were briefly outlined both having quite similar diagnoses and histories. One grew successively healthier and happier after diagnosis and one died shortly thereafter. The Simontons emphasized the major difference between the two was the first man's positive, hopeful attitude toward recovery.

Not only patients, but also their families, benefit from a personal attitude of optimism. Parents of children with leukemia were studied by Friedman et al. (1977). They state:

The element of hope as it refers to a favorable alteration of the expected sequence of events, though hard to evaluate, is of general clinical importance and was universally emphasized by the parents. Comments would be made such as "without hope I could never keep going, though I knew deep down nothing really could be done."
Unlike massive denial, hope did not appear to interfere with effective behavior and was entirely compatible with an intellectual acceptance of reality. That the persistence of hope for a more favorable outcome does not require the need to intellectually deny the child's prognosis is of clinical significance as it differentiates hope from defense patterns that may greatly distort reality (p. 367).

Optimism is as crucial in anticipating crises as in dealing with them day to day. Janis and Mann (1977) found optimistic attitudes toward anticipated disaster to be positively correlated with adaptive behavior and effective decision making (coping). Their four-step conflict theory model for coping with impending emergencies emphasizes the importance of hope. Theoretically, vigilant attitudes are optimal in preparing for disaster, and "hope is the crucial determinant of the quality and duration of vigilant behavior" (p. 43).

One point warrants emphasis. The literature continues to stress that successful coping is not a continuous, closed state of well-being, but an on-going process of employing a broad range of alternate strategies. Jourard (1964) calls this process the "general hope syndrome."

Harmony. A second characteristic of persons who cope well with stress is that their lives are harmonious. In this study, harmony is comprised of three individual attitudes from the Stress Questionnaire (Witmer, 1979). The three beliefs which are transformed and treated as one variable are: (1) the belief that one's values are right and lasting, (2) the beliefs that one's life has meaning and direction, and (3) a feeling of being genuine. These three beliefs are termed harmony.
The certainty that one's values are right and will last is not meant to imply rigidity. Buber (1971) emphasized that although coping persons strive for greater organization of self with values, they still allow for disorganization. Rokeach (1971) made a thorough study of values and found that stability of values had no relationship to ideological dogmatism, but that persons who describe themselves as liberal have more stable values. Persons who employ a close, that is, impermeable value structure also were no more certain of the "rightness" of their values than those who employ an open structure. However, the latter, being about to form new belief systems on the basis of added information, exhibit less anxiety symptoms. Arnold (1960) stated that values are the result of an appraisal that "a thing is good or bad for me here and now" (p. 310). That is not meant to imply that values are transitory, but that they have immediate utility in the appraisal process and that coping persons are both certain of that present utility and are also willing to examine and, when expedient, to alter basic values.

A consideration worthy of emphasis is that the present "rightness" of one's beliefs and values must necessary be validated by the group with which one identifies and has daily interaction. Validation of personal values with group norms gives them substance. Schachter (1959) emphasized this point in asserting that the person who believes that his or her values are right and will last copes well with stress in part due to confidence stemming from group acceptance. Chan (1977) speaking from a sociologist's point of view, also underscored the importance of a consideration of the congruence of an
individual's values with the group in assessing capacity to cope with stress. This emphasis on group validation of values complements, but does not negate, the importance of individual internalization. A subjective as well as objective acceptance of one's values is essential to successful coping.

The state of being without a system of values is psychopathogenic. Human beings need a philosophy of life, religion or a value system just as they need sunlight, calcium and love (Maslow, 1962).

Most humanists ascribe to the opinion that values are a legitimate subject for scientific study, and although they do not directly address the field of stress, much of what they have to say about the centrality of values in the acquisition of positive mental health is applicable to research in that field. For example, Maslow (1954) proposed that certain values are specie-wide and that competent persons live in a system of stable values. Some of those values are truth, goodness and beauty, and although Maslow focused his research on a study of self-actualized persons, stable values are nonetheless characteristic of all persons who cope well with stress. Goble (1976) cited case histories of humanistic psychologists, physicians and scientists who support Maslow's theory, among them Allport, Rogers, Low, Link and Mowrer. Link was said to express the belief that the major problems of his clients were caused by a lack of values, lack of stable beliefs and lack of life objectives. Similarly, Mowrer was quoted as finding that most of his clients' mental problems arose from their not living up to their own moral convictions. Goble (1976) concluded that the recent trend in mental health is movement toward a recognition of the positive relationship it bears to moral values.
Closely related to the preceding belief is the view that one's life has meaning and direction. Goal-directed behavior is firmly grounded in the feeling that one's life has meaning and integrity. For this feeling to prevail, individuals must believe that they are engaged in productive interaction with their environment. Murphy (1962) in her coping project with children, concluded that being able to work actively toward constructive exchanges with, relations with, and feelings about the environment from childhood on is essential to successful coping. Erikson (1963) termed this "purpose" and saw it as a virtue which allows one to pursue goals congruent with one's conscience. The focus is on the dignity and worth which the individual ascribes to him or herself and on the competencies developed in moving toward goals. Frankl (1973) stressed the major impact that finding meaning in suffering and purpose in living had on concentration camp survivors. Conversely, research shows that suicide is correlated with failure to find meaning and direction in life (Buhler and Allen, 1972).

Finally, harmony includes feeling genuine. Rogers (1961) and Rogers and Truax (1967) use the term genuine to mean authentic, transparent, congruent and fully in touch with self. The genuine person has values and attitudes which fit and which are available in present interaction and encounter with one's environment due to a consistency between the "notional" and the "real" values.

So one description I've given of what it means to be congruent in a given moment is to be aware of what's going on in your experience at that moment, to be acceptant toward that experience, to be able to voice if it's appropriate, and to express it in some behavioral way (Rogers in Evans, 1975, p. 20).
Other humanists would agree. The genuine individual is open to self and thus without facade. Jourard’s (1964) "transparent self" is an excellent example. In studying persons who were not genuine or "transparent" Jourard found that those individuals who played out assumed roles became alienated from themselves and suffered both physiological and psychological reactions. Similarly, Jahoda (1958) found that positive mental health depended to a great extent on the accessibility of self to consciousness.

In summary, harmony is a broad, encompassing attitude toward self which acknowledges the orderly wholeness of life, is pleased with it, and is goal-directed to continue to seek even fuller integration.

Man is wiser than his intellect; we only know a part of our awareness, yet we are constantly moving toward it. In altered states of consciousness we are aware of our part in evolving into a greater order and interrelatedness. The more we can bring this tendency into consciousness, the more we will move into an orderly evolutionary flow (Roger, 1978).

**Self-efficacy.** A third cognitive appraisal variable operating in the stress transaction is the perception of self as an effective and competent being. The self-efficacy variable, like harmony, is a transformation of three items from the Stress Questionnaire (Witmer, 1979): control of good events, control of bad events, and assessment of self as a "coper." It is proposed that persons who have learned that they are effective in dealing with stress employ cognitions in the appraisal process which differ from those of persons who do not evaluate themselves as effective. In the present case, persons who rate themselves as able to cope with stress are, in effect, expressing an attitude of self-efficacy.
This capacity of the child to control the impact of the environment through the ability to evoke, select, and limit the amount and kind of stimulation on the one hand, and to increase them both quantitatively and qualitatively on the other, includes the capacity to change the patterning of limitation and augmenting, the narrowing of interests or the broadening of interests, the getting involved in activity or keeping a distance—at different periods of development. Some infants need much more help with this than others do (Murphy, 1970, p. 301).

Mastery, a sense of efficacy, is achieved when the foregoing attempts are successful. When they are not, that is, when the child is either indiscriminately bombarded by the environment or completely cuts him or herself off from it, a sense of helplessness or a persistent tendency to give up results.

The efficacy of young adults in coping with the stressors of college and with demanding or stress-producing careers has also been studied. Silber et al. (1961) found that students who succeeded in college had built a sense of competence by employing rational self-talk and role rehearsal prior to enrolling at the university. The students' attitude was that they would be able to cope with the anticipated situation. Similarly, young Peace Corps volunteers who made successful adjustments to work in foreign countries were those for whom: (1) the self was perceived as causally important and (2) the self was evaluated as effective and potent (Smith, 1966, 8). In the case of the Mercury astronauts whose lives were dominated by stress yet who coped effectively, the overriding finding was that they not only had sharply defined values, but that they also had a high degree of confidence in their ability to cope (Ruff and Korchin, 1967). Related to these findings, Lazarus (1979) cited research indicating that a
too-realistic view of one's self can lead to depression in the face of high stress, whereas an "illusory glow" of competencies is an effective coping tool.

Building a theory of self-efficacy and conducting research to validate that theory has been a major focus of Albert Bandura (1971, 1974, 1977). He developed a model in which an "efficacy expectation" proposed to intervene between an individual and his/her behavior is the result of persons' learning to predict events and in the period of anticipation preceding their occurrence, being competent at summoning up attitudes appropriate to their expectations. Expectation of efficacy in dealing with life stresses involves a cognitive processing of information gleaned from four sources: performance, vicarious experience, verbal persuasion, and emotional arousal. Those cognitions are verified enactively (by direct experience), vicariously, socially (validation with the group) and logically (drawing inferences). Therefore, Bandura postulated an interaction between the person, his or her behavior and the environment. This "reciprocal determinism" emphasizes that the relationship between stimulus and response is not causal but interactive.

Bandura, Adams and Beyer (1977) tested the theory that self-efficacy influences performance by means of enhancing effort on task. The theory was substantiated, for self-efficacy was predictive of level of performance on mastery tasks regardless of the manner in which it was accomplished. Because behavior is guided by the expectation of personal efficacy in anticipated transactions, persons learn to predict
and to summon up appropriate anticipatory reactions. A personal feeling of competence is an outgrowth of an internalized belief, based on past experience, that one can execute a behavior that will lead to a particular desired outcome.

Chan (1977) used the term self-esteem to describe the same construct. As one of the three crucial components in the coping process, self-esteem was described as an accurate sense of mutuality and causality of events. That is, in the coping person there is a belief in a "temporal relationship between planned initiation and operation of efforts to change a sequence of events and actual experience or observation of consequential change in the events" (p. 95). In writing about adaptation to modern society, Mechanic (1974(a)) conceded that holding the belief described above is not an easy task, but is of utmost importance in order to cope with the complexities of today's society.

In Urban Stress, Glass and Singer (1972), brought together some data regarding personal efficacy in dealing with modern stress. They proposed that exposure to stressors has the differential potential to benefit or harm, depending on the individuals' perception of their degree of control over the stressors. Indications are that repeated small frustrations, when subjects perceive that they are capable of handling them, build tolerance. On the other hand, impaired performance results from the subjects' feelings of uncontrollability when they are under stress. Laboratory study on aversive sound and field study on a modern social stressor (a unwieldy bureaucracy)
demonstrate that subjects need not be able, in fact, to control a stressor in order to feel effective, they only need to think that they are in control.

One thing is clear: whether the stressor is aversive sound or aversive shock, the negative after effects in each case vary as a function of unpredictability and perceived lack of control (Glass and Singer, 1972, p. 120).

The major work by Glass and Singer is strong support for the position that it is not the stressor itself but a cognition about the stressor that results in impairment. Considerable laboratory research has been conducted to study that phenomenon. Pervin (1963) reported that persons preferred shocking themselves in order to predict and to have control over the stressor. LePanto, Moroney and Zenhausern (1965) found that when subjects administered pain (heat) to themselves, they increased their threshold over that which was produced by the experimenter. Corah and Boffa's (1970) subjects had lower discomfort ratings for aversive sound in a condition in which escape was available whether or not it was reverted to. Stotland and Blumenthal (1964) gave a series of IQ tests and found less anxiety when the subjects had the option of taking them in random order. Geer, Davidson and Gatchell (1970) experimented with perceived control over aversive shock and found that subjects who thought they could control shock, even though they actually could not, had lower GSRs than those who thought they were helpless. Frankenhaeusern and Gardell (1976) in studying well-being of sawmill workers reported that perceived lack of control over the work process constituted a threat to health. Dohrenwend (1974) in a broad study of stressful life events concluded that the number and
types of events did not discriminate between healthy and pathological subjects, but perceived control over the events did. Finally, Grinker and Speigel (1945, 1966) and Janis (1962), as mentioned earlier, both found that uncontrollability of potential imminent threat resulted in high level anxiety symptoms.

Important contributions to the study of control and its relationship to self-efficacy have been made by Rotter (1966) who proposed that persons can be described on the dimension of internality-externality of control. Internally controlled persons perceive that their actions or personal characteristics have a causal relationship with events in the environment. Persons who are external do not believe in such contingency. It follows, therefore, that persons who perceive that their behavior can have some control over stressors (internal control) will have fewer and/or less intense stress responses. How persons ascribe their control sets limits on the power to choose alternative courses of action. Persons who perceive that they have greater choice because their locus of control is internal, define a situation differently than those whose locus of control is external and who assess their choices as more limited. Situational definition determines appraisal and thus threat and possible stress reactions.

Relatedly, locus of control was hypothesized to be a moderator variable between life change events and subsequent psychological reactions by Johnson and Sarason (1978). Because most correlations between the two variables have been reported as moderate to low, they investigated the possibility that internality and externality would reveal an explanation for those low correlations by virtue of their effect on situational definition. Assuming that life events would have
more adverse effects on "externals' than on "internals," who perceive personal control over events, proved to be correct. Given similar negative life changes, "internals" exhibited less anxiety and depression than "externals."

Stress reactions, anxiety and depression are justification for seeking counseling services, and Gilbert (1976) studied the difference in locus of control between clients in counseling and nonclients in similar environments with similar life changes. She found that perceived control over stress and internal locus of control were characteristic of nonclients, whereas clients with equivalent stressors were more anxious and more often externally controlled.

Pace. Much recent popular literature focuses on the increasing complexity, pace and pressure of modern life as sources of stress. Rapid and complex change has the effect of demanding rapid adjustment, and as a result many individuals, in abortive attempts to keep up and/or keep ahead, suffer psychological and physical damage. On the other hand, persons who control the pace of their lives might also cope well with stress in general.

One aspect of pace which is a source of stress is change. For example, population has increased dramatically in recent years. Since 1800, the total world population has increased three-fold; in urban areas increase has been 40-fold (Levi and Andersson, 1975). In 1800, only four world cities had populations over one million, but by the year 2000 there will be 275 cities with that population (Toffler, 1970). The migration to the cities has increased stressors of noise, crowding, pollution and underemployment. Mental and physical illness are far more prevalent among people who have recently moved, and 20
percent of the U.S. population moves every year (Toffler, 1970). Fried (1963) found psychological reactions to urban relocation to be similar to those found among survivors of major disaster. For example, depression, psychosomatic illness and feelings of hopelessness are typical of "urban nomads."

Theoretical framework for the concept that increased pace or overstimulation is a source of psychological stress and results in impaired quality of life, e.g., physical and psychological suffering, has been proposed by Levi (1971) and Levi and Andersson (1975). The model includes a stimulation continuum, one pole being deprivation or understimulation and the opposite pole being excess or overstimulation. Optimum stimulation, a vertical well-being pole, can swing in either direction with a resultant decrease in physical and mental health.

The optimal amount (of stress/stimulation) obviously varies between individuals, the environmental potential for decreasing the quality of life being a function of the degree of incongruence between individual and group abilities and needs and the environmental demands and opportunities. Equally important is the magnitude of incongruence between individual and group expectations and perceived reality (Levi and Andersson, 1975, p. 19).

Modern life, for most people, is characterized by overly intense environmental demands and opportunities coupled with basic human needs for personal "timeout" to rest, relax and enjoy life. Selye (1956) theorized that humans are endowed with a finite amount of "adaptive energy" and when that energy used to adjust to stress (overstimulation) is depleted, illness and death results. The pace of life definitely has the potential to be a stressor.

Typical of those persons who, according to Selye's theory, are depleting their adaptive energy are the Type A persons described
by Friedman and Rosenman (1974). Working in the area of cardiovascular
disease and behavior, they discovered a greater incidence of cardiac
problems in men who are characterized by a strongly competitive drive
and a chronic sense of time urgency. These Type A men tend to become
agitated with delay and react with hostility, driving up the possi-
bility of contracting high blood pressure and coronary occlusion.
Type B persons, on the other hand, are more patient and deliberate.
They work for personal satisfaction rather than for superior position,
and are free of the hostility bred by overly intense competition. As
a result, they tend to be healthier.

Elaborating on Friedman and Rosenman's "hurry sickness"
concept, Schafer (1978) devised a Hurry Sickness Index by which one can
check one's own propensity for increasing the pace of life. Forbes
(1979) has devised a similar "stress test" checklist on which 14 of the
20 stress-related behaviors are concerned with pace.

Agreement exists among medical and psychological theorists
and practitioners, as well as among members of other professions caught
up in excessive life pace problems, that "hurry sickness" is a reality
and does result in a general decline in well-being. Techniques for
coping with that stress differ according to the professional viewpoint
of the writer, however, although consensus is that the coping must be
engaged in prior to stress. Schuler (1979), a management and business
specialist, suggested dealing directly with time management, making
flow charts, ignoring interruptions and personal concerns during busi-
ness hours. Lecker (1978), a stress management expert, would disagree.
He proposed reducing number and complexity of tasks, reducing time
pressure and increasing coping skills through a focus on personal needs, cognitive rehearsal and relaxation. Pelletier (1977), a psychologist, recommended mediation and biofeedback. Selye (1977), the father of the concept of stress, favored practicing "altruistic egotism" to handle pace. That, in general terms, consists of being kind and caring to one's self and one's acquaintances and electing to make more deliberate choices in fight or flight situations.

**Relationship of Rational Thinking to Appraisal**

One of the basic concepts of cognitive theory is that the cause of much physical and psychological illness is the indoctrination of self with overly intense irrational thoughts. That is, psychosomatic symptoms are thought to be caused by a learning deficiency or maladaptation. Although all cognitive theorists agree with the preceding statements, each has developed a unique statement regarding the nature of the relationship between cognitions and symptoms.

Beck's (1970) view is that in spite of the fact that introspective reports of personal beliefs and attitudes are not directly verifiable, the fact that they are consistent with subsequent behavior renders them useful for forming hypotheses. In reference to his own hypothesis about the relationship between cognitions and neuroses he says:

Systematic study of self-reports suggests that an individual's belief systems, expectancies and assumptions exert a strong influence on his state of well-being...Applying a cognitive model, the clinician may usefully construe neurotic behavior in terms of the patient's idiosyncratic concepts...The individual's belief systems may be grossly contradictory: i.e., he may simultaneously attach credence to both realistic
and unrealistic conceptualizations of the same event or object. This inconsistency in beliefs may explain, for example, why an individual may react with fear to an innocuous situation even though he may concomitantly acknowledge that his fear is unrealistic (p. 184).

The idiosyncratic concepts Beck speaks of were elaborated in an earlier work (1967) as "automatic thoughts." In any given stressful situation, certain persons assess their negative affect as the direct result of the situation, neglecting to recognize an intervening thought in the sequence because it is automatic. Beck extended the "automatic thought" concept to include automatic visualizations, emphasizing the almost instantaneous nature of the cognition intervening between negative event and negative affect. Both can be brought into full awareness only by conscious effort. In working with clients on the skill of "distancing" or achieving objectivity toward the stress-producing event, Beck reported that "patients are often surprised to discover that they have been equating an inference with reality and that they have attached a high degree of truth-value to their distorted conception" (1970, p. 189). Specifically, the automatic thoughts which are associated with subsequent stress reactions are: (1) arbitrary inference, (2) overgeneralization, (3) magnification, and (4) cognitive deficiency.

Meichenbaum (1977), rather than focusing on specific cognitions, emphasized the role that internal dialogue plays in attentional and appraisal processes, the results of which control behavior and emotion. His schema of the cognitive process proposes: cognitive structure → internal dialogue → focus of attention and appraisal → heightened cognitions for new observations → data collection → confirmation or conflict with cognitive
structure — alteration of cognitive structure. Individuals develop new and altered cognitive structure on the basis of the focus of their attention and the new information that may provide. Meichenbaum and Cameron's (1974) self-instructional model uses internal dialogue and focus of attention to help clients eliminate anxiety and negative self-statements and to help them construct and generalize positive statements to future situations.

A distinction is made between fact and truth, the latter being defined as a personal belief existing only in one's mind by Maultsby (1978), who theorized that one's truths direct one's behavior. He proposed that the only expert on an individual's phenomenon is the individual him or herself, and that evaluation of potential harm are made on the basis of habitual subjective perceptions. Working with substance abusers, Maultsby first discovers what the abuser's attributions are, how he or she is perceiving reality, what specific evaluative thoughts seem to be employed, and concludes by encouraging a more logical cognitive appraisal and emotive response. He believes that by altering cognitions, an individual can rid him or herself of the negative physiological effects of abusive behavior.

The instrument employed in the present study for the purpose of evaluating illogical thinking is based on the work of Albert Ellis (1962). His Rational Emotive Therapy is grounded in the belief that thinking creates emotion. The process is an interrelationship between cognition, emotion and behavior. That is, people invariably talk to themselves and the kinds of things they say have the power to create emotional disturbance which interferes with interpersonal activity.
Furthermore, human beings have the unique ability to think about their thinking, and in so doing can create further negative moods by telling themselves negative things, not only about objective events but also about their intrapsychic phenomena. Emotions and behavior are both strongly influenced by an individuals' cognitive expectancy and attributions. When the attributed cause for events is irrational, the ensuing emotion invariably sabotages the individual's chance for happiness. He believes that an expectancy "set" for danger or threat is one of the most important cognitive mediators in psychological disturbance.

**Research Strategies.** Research on the cognitions associated with stress has moved primarily in two directions, one focusing on the cognitive strategies employed in coping with stress and a second focusing on therapeutic intervention in maladaptive stress reactions.

A classic series of experiments exploring cognitive coping styles used as a stressor the anthropological film "Subincision" which depicts an aborigine genital mutilation ceremony. Originally, the film was shown without sound track to subjects for the purpose of measuring physiological reactions to specific stressful scenes. Subsequently, the film was coupled with three sound tracks: one a factual account of tribal ritual (intellectualization); another a minimization of the apparent painful result of the "surgery" (denial); and a third emphasizing the emotional elements (trauma). A control film, without sound, was also used. (Speisman et al, 1964.) The purpose of the experiment was to manipulate cognitive appraisal of a stressful event. Results were that the trauma sound track, as hypothesized, had
the effect of increasing physiological and affective stress reaction, whereas both the intellectualization and denial sound tracks reduced stress reactions. A subsequent experiment (Lazarus and Alpert, 1964) demonstrated even greater reduction of stress reaction when the sound tracks were presented prior to the film. According to the researchers that condition had the effect of "short circuiting" the threat. A later study found no significant differences in the effectiveness of the two coping strategies, denial and intellectualization, on reducing threat (Lazarus et al, 1965).

Later investigations were conducted by the same group of researchers on reduction of stress reactions through the cognitive strategies of involvement and detachment. They again used a stressor film, this time depicting a series of increasingly serious woodshop accidents called "It Didn't Have to Happen." Three conditions of preparatory instruction were given: natural (control), detachment (stressing the positive value of a detached attitude), and involvement ("just let yourself go"). Responses to post-experiment questioning of subjects revealed that a broad range of idiocyncratic strategies had been employed in achieving the desired appraisal. The researchers concluded that involvement appeared to be a more natural human tendency than detachment which required greater effort.

Janis and Mann (1977), researching the process of decision making, found that effective coping did not involve either denial or worry (hypervigilance). Rather, maintaining a vigilant attitude toward the stressor (involvement), encouraging information gathering, weighing alternatives and maintaining optimism regarding the outcome resulted in reduced stress reaction. Assumptions regarding the anticipation of
stress (measured by increased heart rate prior to decision-making) include: (1) decisional style as a function of unsatisfied goal striving; (2) degree of commitment to the present goal; (3) avoidance as a result of lack of non-threatening alternatives; (3) high stress resulting in hypervigilance under time pressure; and (5) vigilance, encouraging effective decision-making under moderate stress.

Houston (1977) investigated the effectiveness of several cognitive coping strategies using two conditions - shock in laboratory memory tasks and evaluation in a testing situation - using both threat and non-threat conditions. Stress reactions were measured by pulse rate and a self-report test anxiety measure. Cognitive coping strategies for rationalization and intellectualization were effective in reducing stress reactions and subjects employing those strategies in threat conditions did not exhibit stress reactions significantly different from subjects in non-threat conditions. Conversely, subjects engaging in active-mastery (hypervigilance, in Janis and Mann's terms, 1977), worry and search for cognitive strategies increased anxiety significantly. Specifically, high trait anxiety was positively correlated with low frequency of intellectualization and high frequency of non-productive worry.

Girodo (1977) made the significant observation that all research that has been done on cognitive coping strategies had been directed toward cognitions employed in coping with an identified stressor. His research examined the utility of the on-going self-statements, self-talk and rational thinking engaged in during the appraisal period prior to the onset of a stressor. He suggested that three processes may be operating in that period: self-persuasion, attentional
diversion, and cognitively-cued behavior. With regard to self-persuasion he said: "The statement 'Every day in every way I am getting better and better' contains no rational persuasive logic that could induce a person to 'get better' no matter how often it is repeated" (p. 231). Although Ellis and Beck both use this technique and although it is the method of prayerful faith, Girodo noted that one must share the belief system in order for the words to be functional. Attentional diversion, as used in coping with pain for example, was found to be effective only if coupled with persuasion. He proposes cognitively-cued behavior to have the most utility. Citing the work of Meichenbaum and Goodman (1971) and Morris and Lieber (1970), Girodo suggested that emitting a self-statement while engaging in overt behavior increases one's ability to cope. Results of his research revealed that for fear-of-flying females, emitting coping statements for which a rationale had been accepted were effective in reducing stress reaction only when opportunity for on-going situational appraisal was available. Extrapolating, it appears that techniques employed in on-going everyday appraisal of potential threat could have the effect of predisposing individuals to emit idiocyncratic self-statements which, if negative, could intensify such stress reactions as anxiety.

**Therapeutic Intervention.** Altering self-statements for the purpose of reducing anxiety and physical symptoms is the aim of cognitive therapy. Meichenbaum (1975,b) stated that his purpose in therapy was to: "promote therapeutic gain by altering the cognitive processes of the
anxious client" (p. 237) because he believes that emotion does not depend on physical arousal, but on how that arousal is labeled. His self-instructional method (1975, a) has been reported as being effective for eliminating test anxiety and severe fears as well as for enhancing creativity.

Paul (1966) found a combination of insight into the clients' negative self-talk and desensitization through emitting specific positive self-statements to be effective in reducing anxiety. His method was investigated and supported by Wine (1971) who found that insight into clients' negative self-talk was not effective in reducing stress reactions unless paired with instruction in methods for replacing negative with positive cognitions. Other therapists have also developed specific techniques for reducing stress reactions that vary with their own theoretical postures.

Goldfried et al (1974) employed systematic rational restructuring in enhancing clients' self-control beginning with an "I can cope" self-statement and proceeding through gradually more stressful situations designed to culminate in the ability to think and behave rationally in situations. Beck (1971), mentioned earlier, noted that anxiety level fluctuated with positive and negative self-statements and trained clients to identify maladaptive thoughts, distance themselves from the thoughts and modify or replace them with more adaptive thoughts. Finally, Ellis (1962) reported positive results in treating marital and sexual problems with rational emotive therapy in which clients were instructed to recognize the illogic of their cognitions and induced to internalize rational ones.
Therapy aimed at correcting maladaptive cognition has been conducted with clients suffering from such diverse disfunctions as anxiety (Goldfried and Sobocinski, 1975; Beck and Russ, 1975), phobias (Bandura, 1969), fear of physical examination (Fuller, Endress and Johnson, 1977), guilt (Tosi and Reardon, 1976), cancer (Weisman and Sobel, 1979), and mastectomy (Worden and Weisman, 1977).

Summary. Ellis (1962) brought coherence to the study of cognitions in proposing that an individual's psychological distress could be traced to eleven specific irrational cognitions. Unlike the cognitions of the preceding section, his are not restricted to attitudes about self. Rather they are generalized beliefs about how things are or "should" be. He theorized that when faced with a stressor, the illogical individual automatically engages in a faulty cognition which produces a stress reaction. The present study proposes that six illogical cognitions, factor-analyzed from Ellis' original eleven beliefs (Bessai, 1977), are positively correlated with anxiety and physical symptoms. They are: an emphasis on the importance of the past in determining the present, a proneness to blame, a tendency toward self-downing, a need for the approval of others in order to approve of one's self, a need to be perfect, and a tendency to not be in control of one's emotions. These cognitions along with the beliefs about self, optimism, harmony, self-efficacy and sense of satisfactory pace mentioned in an earlier section, are proposed to be positively correlated with physical and psychological health. Conversely, absence of such cognitive appraisal variables is proposed to be positively correlated with physical and psychological suffering.
Measures of the Stress Reaction

An individual can develop either physical or psychological symptoms as a result of maladaptive interaction with external stressors, although individuals who suffer stress reactions typically do so in both the affective and physical domain. A study of psychosomatic literature reveals that anxiety and/or depression, particularly occur in conjunction with hypertension, ulcers, low back pain, insomnia, hay fever, migraine headaches and a host of other physical complaints. In fact, Brown (1974) found that persons who suffer psychologically tend to respond to physical symptom checklists with a greater number of symptoms. This fact has confounded research on the relationship between stressors and illness. It has been conjectured that being subjected to or interacting with stressors may not result in illness, but in psychological attitudes encouraging illness behavior (Mechanic, 1976). The close relationship between the two types of symptomatic reactions becomes even more evident in comparing screening devices used by mental health researchers and psychiatric hospitals and clinics. In general, these questionnaires and checklists request information regarding both affective and physical symptoms (Langer, 1962; Gurin, Veroff and Feld, 1960; Wyler, Masuda and Holmes, 1968; Spitzer, Endicott and Robins, 1977).

Tessler and Mechanic (1978) report results of a national survey in which it was reported that people dissatisfied with their health are also less likely to have a strong sense of well-being. In their study, results from four sets of data indicate that regardless of the specific population studied and controlling for actual
health status, subjects who reported psychological distress, e.g., nervous, lonely, depressed, restless, also reported a subjective perception of themselves as having been physically ill during the past three months. The authors concluded that the association is undoubtedly reciprocal rather than causal in nature and that subjects' perception of suffering is global.

In a National Institute of Mental Health study of 500 subjects (Bradburn and Kaplovitz, 1965) the concept of psychological well-being was investigated. Of the dimensions on which data were gathered, the two criterion variables of this study, physical health and anxiety or worry, were positively correlated with each other and negatively correlated with psychological well-being. Finding similar high positive correlations between the two types of symptoms in a nationwide mental health study led Gurin et al (1960) to conjecture that assessing psychosomatic symptoms may be an alternate way of measuring anxiety. Kata (1975) goes so far as to suggest that the relationship between anxiety and health is trivial. Making the argument that some worry is realistic and that persons who are ill care about that fact, he dropped the "health worry" item from his survey and changed the explained variance less than one percent.

Finally, Tyrer's (1976) psychiatric monograph offered an anxiety continuum, one pole being functional disorders (100 percent somatization of symptoms) and the opposite pole being psychological symptoms (100 percent psychological interpretation of symptoms). Differential medical treatment would be offered depending on where on the continuum one places the patient, but anxiety would be an inclusive term for the full range of suffering attended to.
In spite of the preceding overlap, it is hypothesized that employing two criterion variables—physical symptoms and anxiety—is a logical procedure. In the present study, neither instrument measuring the variables includes with symptoms from the other measure, and each enhance the value of the other.

**Physical Symptoms.** By far the preponderance of data on the relationship between stress and illness is the result of a fairly recent body of research on life change events. Although, as early as 1929, Cannon ascribed the occurrence of physical "derangement" to the occurrence of such stressors as are presently studied, and the first method for systematically studying the relationship between life events and illness was Mayers' life chart (Lief, 1948). He devised a schema for illustrating the interrelatedness between the biological, social and psychological aspects of an individual's life. Based on that research, Holmes and his colleagues (Holmes and Rahe, 1967; Rahe, 1970; Masuda and Holmes, 1967(b)) developed and validated a life change events scale. Items selected for the scale were those events in people's lives which seemed to be associated with demands for coping behavior. They were weighted according to their hypothesized impact on the individual, marriage being the baseline for assessing impact. A series of cross-cultural studies and studies with selected subject groups resulted in consistently positive correlations between total scores on the scale and the onset of illness.

A conference on stressful life events (Dohrenwend and Dohrenwend, 1974) afforded an opportunity for other researchers to report results of studies on other populations and with varied
results. Hinkle (1974) researched four widely diverse populations: telephone company employees, Chinese refugees, migrants from the 1956 Hungarian uprising, and former Korean conflict prisoners of war. He found that a significant number of his "healthy" subjects had high scores on the Social Readjustment Rating Scale (SRRS) but did not become ill. Hinkle emphasized the general nature of physical illness in justifying his results and expressed the belief that causality between life events and illness is not a one-to-one relationship. Rather, differences in response to change lie in the biological, social and psychological phenomenon of the individual.

Paykel (1974) reported that only undesirable events preceded depression in his subjects and moreover those depressed patients which he studied reported three times more life change events than a matched control sample. This finding supported an earlier study (Thurlow, 1971) in which only the items on the scale which could be classified as "subjective" were predictive of illness.

A discussion by Mechanic (1974,a) emphasized the importance of subjective perception of health. In a study of 151 female subjects, he found that the largest difference between those reporting good health and those reporting poor/fair health was the occurrence of emotional difficulty and "nerves." He noted that poor health is associated with a wide range of personal problems and psychological distress which may affect the total life change score.

Holmes and Masuda (1974) themselves presented results of studies with naval personnel, medical students and heart and diabetes patients in which 93 percent of the major health changes followed a
cluster of life events classified as mild to major on the SRRS scale. They suggested that illness may be due to adaptive body efforts causing a decreased resistance to disease. That explanation supported the earlier work of Selye (1956) on "diseases of adaptation," a theory that human beings are endowed with a finite amount of adaptive energy which is depleted by exposure to stressors, such depletion resulting in physical debilitation and eventual death.

Although much research employs life change events as stressors bearing a causal relationship to physical symptoms, other stressors are also utilized. Tutone (1977) investigated certain correlates of illness susceptibility among 55 male college students over a four-year period. In a stressful laboratory situation he found that prior psychosocial stress was positively correlated with the tendency to respond to the threat of potential shock with elevated physiological reactions. Stress reactions were also investigated in a five-year field study of the Dutch population (Aakster, 1974) who concluded that psychosocial stress was positively correlated with health disturbances among the population. Aakster's hypothesis, that illness results from a failure to adjust to psychosocial stress, emphasized that although psychosocial events can be considered stressors, the interactive nature of stress cannot be ignored. Adjustment or successful goal-attainment is an on-going process of interaction with the environment. If stressors interfere with goal-attainment, physical illness may result.

Frankenhaeusern (1977) studied the psychophysiological and endocrine stress reactions of subjects in field and laboratory settings. Results of the field studies, in which constricted,
machine-paced work settings were employed as stressors are relevant to the present study. She found increased noradrenaline secretions and self-report of negative affect to be associated with the stressful work conditions. Subjects described their affect as "irritated" and "rushed" and worker absenteeism was correlated with the work conditions and the workers' negative affect. Groen and Bastiaans (1975) were also concerned with social and political conditions as a source of stress. They, too, studied stress conditions at work and in the home.

The common denominator in these factors (psychosocial stressors) is that they make it difficult or impossible for particular individuals or groups to anticipate future events in their social environment and in the efficacy of their own coping behavior to such events. Compared with earlier or more simple cultures, Western society is characterized by complicated, randomized complications of multiple (often contradictory) psychosocial signals, rewards and punishments. Insufficient is an important factor in the causation of...psychosomatic disease (p. 49).

Finally, Pancheri et al. (1978) suggested that illness itself is a stressor. Follow-up studies of 58 male coronary patients indicated that patients who were classified as not improved ten days following admission differed significantly from those who were improved on a measure of anxiety and depression. The authors concluded:

Only a few traits (aggressiveness, tendency to individualism, competitiveness, urgent sense of time) can be considered significant in the pathogenesis of heart attacks, while other traits such as anxiety and depression seem rather to be consequences of the illness (p. 17).

Anxiety. A transition to the second predictor variable, anxiety, warrants repeating the initial observation that physical and
psychological stress reactions are virtually inseparable. Tessler and Mechanic (1978) examined the close association between people's subjective assessment of their physical health and their level of psychological distress. The authors point out that while physicians attempt to specify disease,

Patients, on contrast, view their health status in a somewhat more global fashion...they react more experientially to their overall sense of well being...when asked to indicate what people mean when they say that they are in good physical condition, a typical response was 'they're always in good spirits, never irritable or cranky, and have a good outlook on life' (p. 254-255).

The American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, Second Edition (DSM II, 19) defines anxiety as:

characterized by anxious over-concern extending to panic and frequently associated with somatic symptoms. Unlike phobic neuroses, anxiety may occur under any circumstances and is not restricted to specific situations or objects. This disorder must be distinguished from normal apprehension or fear, which occurs in realistically dangerous situations.

It should be noted that the definition clearly separates anxiety from the physical symptoms which frequently accompany it. Somatic complaints, although quite frequently seen in anxiety patients, are not synonymous with anxiety itself. Also, anxiety is defined as discernable from both realistic fear on the one hand, and phobic reactions on the other. Freedman, Kaplan and Sadock (1976) offer a fuller clinical description of anxiety which elaborates on those distinctions.

The patient is overwhelmed with a sense of some imminent catastrophe about to engulf him...Sometimes the patient cannot specify what he dreads, and the mystery about what lies ahead and about what is causing his
panic only adds to his desperation... The anxiety often has an impelling quality; the patient feels that he must do something - run, hide, scream, or get away - although just what is to do or where is is to go is as undefined as the reason for his terror (p. 610-611).

The nature of anxiety as described above is nebulous and difficult to clearly conceptualize. However, as early as 1894 Freud delineated anxiety as a discrete illness. Later, based on clinical practice (1936), he conceptualized anxiety in the psychoanalytic tradition familiar today. That is, anxiety is a cue or signal warning an individual of the impending emergence of incompletely repressed material which, if brought into consciousness, would pose a threat. He suggested that anxiety precedes and may also occur in concert with all mental disorders.

Without rejecting the psychoanalytic tradition, May (1950) recognized the contributions of its major theorists in a synthesized theory of anxiety.

It is agreed by students of anxiety - Freud, Goldstein, Horney, to mention only three - that anxiety is a diffuse apprehension, and that the central difference between fear and anxiety is that fear is a reaction to a specific danger while anxiety is unspecific, vague, objectless... Anxiety is the apprehension cued off by a threat to some value which the individual holds essential to his existence as a personality. An individual experiences various fears on the basis of a security pattern he has developed; but in anxiety it is this security pattern itself which is threatened (p. 190-191).

Threat as a concomitant of anxiety is especially germane to the present study. Lazarus (1966) described anxiety as a response to the appraisal of threat, such threat appraisal functioning as an intervening variable between a stimulus stressor and the anxiety response. Specifically, he proposed that five levels of awareness comprise the
appraisal process: (1) knowledge of the situational details, (2) knowledge of one's own psychological system, (3) knowledge of the relationship between them, (4) knowledge of the constraints and contingencies of possible coping actions, and (5) anxiety.

Defining anxiety is no more difficult than determining who is suffering from it. In the first of a five-volume series on *Stress and Anxiety* (Spielberger and Sarason, 1975, 1977, 1978), Lader (1975) comments on the dilemma.

There are undoubtedly deficiencies in many of the studies I shall cite with respect to criteria for neurosis, anxiety states, etc. In several studies the unstandardized definitions of individual general practitioners have been used and the results sometimes throw more light on the variability of doctors' views than on the prevalence of anxiety (p. 6).

In this vein, he cites diverse reports of patients suffering from stress-related anxiety: four percent of the patients seen in one clinic as compared to more than half the patients seen in another. An exhaustive study of medical records and research studies in a variety of urban-rural, industrial-farming and affluent-deprived British communities, however, caused him to conclude that probably one-third of the adult population suffers from anxiety. The proportion is higher in females than in males, in older than in younger, and appears to be genetically linked.

Wide discrepancies reported by Lader underscore the need for a sharply limited focus for and definition of anxiety. The present study utilizes the concept of trait anxiety (Spielberger, Gorsuch and Lushene, 1970) in hypothesizing a relationship between that affect and the stress reaction. Specifically, state anxiety is conceptualized as
a transitory emotion which can be recognized by heightened tension and autonomic nervous system activity, whereas trait anxiety is a stable, individual predisposition to view a wide variety of situations as threatening, thus more frequently manifesting elevated state anxiety levels. Spielberger proposed that persons who perceive a particular situation as threatening will respond to it with elevations in state anxiety irrespective of any real or objective danger. The intensity and duration of the reactions will be determined by the amount of threat that persons attribute to the situation and by the persistence of their appraisal of the situations as threatening. Although a specific situation may be generally described as dangerous by most people, whether or not it is perceived as threatening by any particular person will depend on results of past experiences and the probability that such a state will be experienced in the future. Evidence produced so far by Spielberger and his colleagues strongly supports the notion that situations involving failure or threats to self-esteem are those in which state anxiety reactions are likely to be differentially aroused.

The concept of a distinction between state (A-state) and trait (A-trait) anxiety has been widely explored. Gaudry, Vagg and Spielberger (1975) engaged 345 high school and 250 university students in intelligence testing under one non-stress and two stress conditions. They were able to discriminate one factor for trait anxiety and factors for state anxiety under each threat condition. The results supported the hypothesis that situational stress can evoke state anxiety. Earlier, Hedl (1972) also utilizing intelligence tests, found that test
anxiety was less responsive to situational stress than was state anxiety. He concluded that test anxiety is more closely related to trait than to state anxiety.

Other studies have attempted to discriminate between state and trait anxiety in learning situations. King, Heinrich, Stephenson and Spielberger (1976) administered the State-Trait Anxiety Inventory to college graduate students in conjunction with mid-term and final examinations. They found that trait anxiety was stable over time, but state anxiety fluctuated with the evaluation condition. Further findings suggested that A-trait has a direct influence on academic achievement. O'Neil (1972) selected 73 female college students who scored in the upper and lower twentieth percentile in anxiety proneness. Under stress, i.e., receiving false negative feedback regarding test performance, high trait anxiety subjects showed higher state anxiety reactions than did low trait anxiety subjects. In a subsequent learning task, high A-trait subjects made more mistakes than low A-trait subjects during the easier sections of the test, but made less mistakes on the harder parts. Subjects high in trait anxiety who responded with elevated state anxiety leading to impaired performance on simple tasks, were more reactive to situational stress.

The fact that elevated state anxiety invariably occurs in high trait anxiety subjects under evaluative (testing) conditions led Hodges and Felling (1970) to investigate the relationship between fear of failure and trait anxiety. Their hypothesis, that subjects high in A-trait would anticipate greater fears under evaluative conditions than under threat of pain, was supported. Of four factors analyzed from a
forty-item situational questionnaire, only the factors involving possible failure were correlated with a measure of trait anxiety. Failure or loss of self-esteem were especially threatening to subjects high in A-trait.

Related to the threat posed by loss of self-esteem is the individual's need for achievement. Gaudry (1977) reported results of four success/failure studies. State anxiety scores for failure groups were significantly higher than for success groups. Situational stress was significantly related to changes in A-state, but not to A-trait. In the first study reported, a significant treatment by attainment interaction was noted; a single success experience resulted in immediate reduction of state anxiety, and the converse was also true.

Not need for achievement but the related motive to avoid success (MAS) was investigated by Patty and Safford (1977). The relationship between state and trait anxiety and the concept of a female-linked pattern of achievement behavior was studied with 70 undergraduate females and 60 undergraduate males. Subjects were administered a projective MAS assessment and a digit-span backwards task. Low MAS females performed well on the difficult parts of the digit span, as did the males; both viewed the task as a challenge to be approached. Low MAS females did not do well on the easy parts of the digit span, dismissing them as unworthy of attention. Conversely, high MAS females performed less well on the difficult portions of the test and also had elevated A-state scores, unlike the low MAS females. Their higher A-trait scores and motives to avoid success interacted with demanding tasks. The projective measure was unrelated to anxiety.
The concept of a distinction between A-state and A-trait has been tested in medical, as well as educational, settings. Spielberger, Auerbach, Wadsworth, Dunn and Taulbee (1973) found that threat of imminent surgery caused elevated state anxiety in high trait anxiety subjects. Auerbach (1973), in a similar study, found that subjects' A-trait remained the same before and after surgery, but A-state declined slightly up to 48 hours after surgery and markedly thereafter. The rate of decline bore no relationship to type of surgery, medical history or subjects' age. Indications were that moderate levels of anxiety facilitated recovery, supporting Janis' (1962) suggestion that a vigilant attitude toward impending danger is facilitative.

Spielberger has published few studies recently. Reportedly, he is in the midst of a research project to be published in the near future. His last published study on the State-Trait distinction related results of stressful conditions in children's story theatre (Kase, Sikes and Spielberger, 1978). Employing the State-Trait Anxiety Inventory for Children, researchers found individual differences in trait anxiety in their young subjects. Heightened state anxiety levels were evidenced in children watching frightening scenes in story theatre, particularly in girl subjects. Implications for the impact of drama on children was stressed.

In his last major work, Spielberger (1975) summarized and enlarged his thinking about anxiety in the following manner:

Anxiety as an emotional state (A-state) is characterized by subjective, consciously perceived feelings of tension, apprehension, and nervousness accompanied by or associated with activation of the autonomic nervous system...Trait anxiety (A-trait) refers to relatively stable individual differences in anxiety proneness...It
now seems apparent that the term "anxiety" is also used by a number of personality theorists to refer to a complex process. Consequently, anxiety as a process needs to be added to the distinction between anxiety as a transitory state and as a relatively stable personality trait... An anxiety state is at the core of the anxiety process, which may also involve (a) cognitive appraisal of a stressful situation as personally threatening, (b) psychological defenses that are activated in an effort to reduce or alleviate intense and unpleasant anxiety states, and (c) behaviors that are motivated by intense levels of A-state... (p. 137-138).

In the following volume, his co-editor (Sarason, 1975) addressed the process of cognitive appraisal in anxiety. He pointed out that anxiety is "a type of self-preoccupation characterized by self-awareness, self-doubt, and self-preoccupation. These cognitive activities exert impact on both overt behavior and physiological reactivity" (p. 27). He proposed that certain cognitive preoccupations interfere with realistic perceptions of environmental cues and color decisions made about them. Anxiety is one direct result of interfering, evaluative cognitions.

Summary

A review of the literature relevant to the relationship between cognition and stress warrants drawing certain conclusions. First, the ability to cope effectively with stress and not to suffer from anxiety or physical symptoms is linked to the process of stress appraisal. Appraisal is the activity engaged in during the period between perceiving a potential stressor and engaging in coping behavior. Research indicates that the appraisal process is highly individualistic and depends both upon the subjective perception of an event as threatening or motive-thwarting and upon the evaluation of
one's power in relation to the event. Indications are that persons who typically appraise situations as threatening hold beliefs and attitudes which differ from those of persons who typically appraise situations as benign or challenging. That is, they engage in qualitatively different and discriminating self-talk in terms of attitudes about self and in general rational or irrational thinking.

Four attitudes toward self emerge as important discriminators between those who do and those who do not cope well with stress. Optimism is the first attitude and involves being generally hopeful and positive about one's life. Second, literature indicates that persons who cope well view themselves as congruent, purposeful and genuine. Those beliefs can be subsumed under the broader belief that one's life is harmonious. Third, research in both laboratory and field studies shows that a belief in one's ability to exercise control over life, or self-efficacy, is a component of successful coping. A fourth belief, that one's life is neither overly rushed nor exceedingly unstimulating is characteristic of the person who copes well. Finally, rational thinking is associated with successful coping and with the non-threatening appraisal of potential stressors. Absence of thoughts about how things "should" be and a flexibility to deal with situations uniquely are characteristic of the coping person.

Although the literature indicates that virtually any event has the potential to be appraised as threatening, thus negating the need to extract a specific stressor from the interactional process, the stress reaction itself is generally quite specific. Two reactions most frequently cited as stress-related are anxiety and physical
symptomatology. In most cases, both are exhibited by the individual who does not cope well. In the present research, anxiety is not seen as a signal for engaging in defenses, but as a reaction to the perception of a stressful event or situation. Viewed thusly, its relatedness to physical reactions is more clearly evidenced. Both are the results of a propensity to evaluate situations in a negative or threatening manner.
CHAPTER III
RESEARCH DESIGN

Introduction

This study will investigate the relationship between cognitive appraisal variables which may mediate between potentially stressful events and resultant stress reactions. Stress reactions employed in the correlation are trait anxiety and physical symptomatology.

Cognitive appraisal variables are of two kinds:

1. personal beliefs and attitudes about self
   a. optimism
   b. harmony, including feeling genuine, having stable and lasting values, and believing that life has meaning and direction
   c. self-efficacy, including being confident in one's ability to cope and perceiving control over events
   d. satisfactory life pace, that is, not feeling "rushed"

2. general rational/irrational beliefs
   a. importance of the past in determining the present
   b. a proneness to blame
   c. a tendency toward self-downing
   d. the need for others' approval to approve of one's self
   e. a need to be perfect in all ways
e. a belief that one is not in control of one's emotions

The design for this study is a canonical correlation analysis, using the cognitive appraisal variables as the predictor variables, and trait anxiety and physical symptoms as the criterion variables. Levine (1977) states that canonical analysis is the method of choice when working with the following data set and when seeking to answer the following question:

Data set:

Two sets of variables measured across the same units of observation at a point in time, that is, a standard subject-by-variable cross-sectional data matrix divided vertically in half... (p. 9).

Question:

What can I say about one of these sets of attributes of these cases from knowledge of the other sets of attributes? (p. 9).

Research Setting

Data for this study were gathered through three university credit seminars on three different university campuses during the Spring and Summer Quarters, 1979. Seminars were conducted by an experienced counselor educator, a recognized expert in the field of stress management. Data were incorporated into an on-going stress research project. The present researcher assisted with the first seminar, collecting and studying data leading to the present research.
Seminar A. The first of the three seminars was conducted on two successive Fridays and Saturdays during Spring Quarter, 1979, at The Ohio University, Lancaster Branch. The course was titled "Coping With Stress" and was offered for both graduate and undergraduate credit. The graduate and undergraduate students met in a large open classroom which was physically adaptable to both the lecture and experiential components of the seminar.

Seminar B. The second seminar was offered during Spring Quarter, 1979, on the main campus of Ohio University in Athens under the title "Biofeedback and Stress Management." The seminar met for a two-hour period once a week for ten weeks with only graduate students participating.

Seminar C. The final setting was another "Coping with Stress" seminar offered for graduate credit only at Rollins College, Florida, during the Summer Quarter, 1979. This seminar met daily, eight hours per day for five days.

Sample

Subjects for the present study include persons in two categories: seminar students who completed instruments during the seminar sessions, and volunteers to whom the students administered the instruments. Total number of subjects from all three seminar groups is 292. A demographic description of the subjects is presented in Table 1. Summary statistics indicate that the mean age for all subjects is 33.6
and the age group range is 12 to 86, with a standard deviation of 12.7. Subjects are categorized by sex, marital status and socioeconomic status.

Table 1
Description of Subjects by Age, Sex, Marital Status and Socioeconomic Status**
(N = 292)

<table>
<thead>
<tr>
<th>Age</th>
<th>Sex</th>
<th>Marital status</th>
<th>Socioeconomic status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total*</td>
<td>Total*</td>
<td>Group</td>
</tr>
<tr>
<td>18 under</td>
<td>22</td>
<td>Male 119</td>
<td>Single</td>
</tr>
<tr>
<td>19 - 25</td>
<td>50</td>
<td>Female 159</td>
<td>Married (1)</td>
</tr>
<tr>
<td>26 - 35</td>
<td>93</td>
<td></td>
<td>Married (+1)</td>
</tr>
<tr>
<td>36 - 45</td>
<td>69</td>
<td></td>
<td>Divorced</td>
</tr>
<tr>
<td>46 over</td>
<td>44</td>
<td></td>
<td>Widowed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cohabiting</td>
</tr>
</tbody>
</table>

*totals do not add to 292 because some subjects did not respond to all items.

**detailed description of subjects appears in Chapter IV.

The six marital status categories include: single, married once and presently married, married more than once and presently married, divorced or separated, widowed, and cohabiting on a long-term basis. Socioeconomic status is determined by computing Hollingshead's (1957) Two-Factor Index of Social Position. In computing this Index, two factors are considered - occupation and level of formal education. Each factor is first weighted, then added. The resultant Index number is converted to a social class level, Level I being the highest and Level V being the lowest.
Subjects from the three seminars differ in some respects from the total sample, due to variations in data collection. The following sections address those differences in sampling.

Seminar A. Subjects in the Lancaster, Ohio, seminar include 12 graduate students, 22 undergraduate students, and 111 volunteers. According to instructions given to the students, they were to choose volunteers who varied in age, socioeconomic status and occupation. In addition, students administering the instruments to the volunteers were instructed to use judgment in selecting persons who were apparently coping well with stress and persons who seemingly were not coping well. The seminar students themselves were given the option of not participating in the data collection, and no subject was required to answer questions which were offensive or stressful. Some data were gathered in this seminar which were not included in the present study. Those data include results from one seminar student who chose not to be included, 10 volunteers who did not complete all instruments, and 14 subjects whose responses were judged to be invalid. Judgment as to validity was made in cooperation with a statistical consultant on the basis of plotting scattergrams. This subject sample most nearly resembles the total subject group with regard to age, sex, marital and socioeconomic status.

Seminar B. Subjects in the Athens, Ohio, seminar include 114 volunteers to whom seminar students administered the instruments. The seminar students themselves did not complete the instruments
because data were gathered between the sixth and tenth week of the seminar, after students had received instructions in the theory and methodology of stress management. Students administering the instruments were given instructions similar to those given to Seminar A students regarding selection of volunteers and options for responses. Demographic data for this group indicates a greater percentage of males, single persons and socioeconomic Level V than in the total sample. Level V includes adult students.

Seminar C. The 33 graduate students enrolled in a seminar at Rollins College, Florida, comprise the third sample group. These students were primarily teachers, counselors, and government and agency employees. They completed the instruments during the first day of the seminar, but they did not administer instruments to volunteers. The format of the seminar, which met on five consecutive eight-hour days, did not lend itself to the kind of preparation which was deemed necessary for having students enlist volunteer subjects. Although the mean age for this group was virtually the same as that of the total sample, the range was much narrower. Also, this group was primarily female, married and in socioeconomic Level II.

Instrumentation

The study utilizes four instruments: Self-Evaluation Questionnaire (STAI) (Spielberger, Gorsuch and Lushene, 1970); Physical Frequency and Intensity Checklist (PFIC) (Witmer, 1977); Common Beliefs Survey III (CBS III) (Bessai, 1976; and Stress Questionnaire I (SQ I) (Witmer, 1979).
Self-Evaluation Questionnaire (STAI)

Description. Based on Spielberger's (1966) conception of a differentiation between state (A-state) and trait (A-trait) anxiety, the instrument was developed in its present form by Spielberger, Gorsuch and Lushene (1970). The theory proposes that A-state is transitory, characterized by heightened tension and feelings of fear and/or apprehension. It varies over time. A-trait, on the other hand, is a generally stable propensity to view situations as threatening. Persons high in A-trait respond to a greater variety of situations with an elevation in A-state because they view a wider variety of situations as threatening. In clarifying their differentiation between state and trait anxiety, Spielberger, Gorsuch and Lushene (1970) make the analogy between kinetic and potential energy.

State anxiety, like kinetic energy, refers to an empirical process or reaction taking place at a particular moment in time and at a given level of intensity. Trait anxiety, like potential energy, indicates differences in the strength of a latent disposition to manifest a certain type of reaction (p. 3).

Of particular importance to the concept of trait anxiety is threat, especially the threat of evaluation. This emphasis makes the Spielberger instrument particularly useful in the present study, since Lazarus' (1966, 1979) conception of stress appraisal is employed in the present study and it has a heavy evaluative component.

Format and administration. The instrument consists of twenty items in each of two categories - state and trait. Subjects are asked to respond to the A-state sentence with how they feel "at this moment."
Directions for A-trait statements instruct the subjects to respond as they "generally" feel. Responses are made on a Likert-type scoring sheet with four options ranging from "almost never" to "almost always" on the A-trait scale and from "not at all" to "very much so" on the A-state scale. Half of the items are reverse scored to eliminate errors of response set. Subjects can complete both halves of the inventory in approximately ten minutes, or either half can be administered separately.

**Scoring.** Scores range from a low of 20 (1 point per response) to a high of 80 (4 points per response) on each half. Each half is always scored and reported separately. Norms are available for high school and college students, neuropsychiatric and general medical patients, and prisoners.

**Reliability.** Test-retest reliability is reported in Table 2. The low reliability for A-state (.33 for males and .16 for females after one hour) is to be expected as A-state fluctuates with circumstances. The difference in reliability for each half gives credence to the differentiation between A-state and A-trait.
Table 2
Test-retest Reliability for College Undergraduates

<table>
<thead>
<tr>
<th>Category</th>
<th>Time Lapse</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 hour</td>
<td>20 day</td>
<td>104 day</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>r</td>
<td>N</td>
<td>r</td>
</tr>
<tr>
<td>A-trait</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>males</td>
<td>88</td>
<td>.84</td>
<td>38</td>
<td>.86</td>
</tr>
<tr>
<td>females</td>
<td>109</td>
<td>.76</td>
<td>75</td>
<td>.76</td>
</tr>
<tr>
<td>A-state</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>males</td>
<td>88</td>
<td>.33</td>
<td>38</td>
<td>.54</td>
</tr>
<tr>
<td>females</td>
<td>109</td>
<td>.16</td>
<td>75</td>
<td>.27</td>
</tr>
</tbody>
</table>

Internal validity has been computed by the KR 20 formula devised by Kuder and Richardson (Cronbach, 1970, p. 160 ff). This method is used to compare the consistency of each item in relation to all other items through the computation of an Alpha coefficient or variance ratio. Table 3 gives the internal consistency for high school and college undergraduate students on the A-trait scale.

Table 3
Means, Standard Deviations and Alpha Reliabilities for High School and College Students

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Undergraduates</th>
<th>High School Students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>male</td>
<td>female</td>
</tr>
<tr>
<td>Mean</td>
<td>37.68</td>
<td>38.25</td>
</tr>
<tr>
<td>SD</td>
<td>9.69</td>
<td>9.14</td>
</tr>
<tr>
<td>Alpha</td>
<td>.90</td>
<td>.89</td>
</tr>
</tbody>
</table>
Validity. Correlations of the STAI with other instruments measuring anxiety are given in Table 4. Significant positive correlations are reported between the STAI and three other established instruments measuring anxiety using three different groups of subjects. These correlations, along with the fact that the STAI is among the most completely researched anxiety instruments available (Buros, 1978), makes it appropriate for this study.

Table 4
Correlations between the STAI A-trait Scale and Other Measures of Trait Anxiety

<table>
<thead>
<tr>
<th>Scale</th>
<th>College Females (N = 126)</th>
<th>College Males (N = 80)</th>
<th>NP Patients (N = 66)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>STAI IPAT TMAS</td>
<td>STAI IPAT TMAS</td>
<td>STAI IPAT</td>
</tr>
<tr>
<td>IPAT</td>
<td>.75</td>
<td>.76</td>
<td>.77</td>
</tr>
<tr>
<td>TMAS</td>
<td>.80 .85</td>
<td>.79 .73</td>
<td>.83 .84</td>
</tr>
<tr>
<td>AACL</td>
<td>.52 .57 .53</td>
<td>.58 .51 .41</td>
<td></td>
</tr>
</tbody>
</table>

Physical Frequency and Intensity Checklist (PFIC)

Description. This instrument is designed to measure physical discomfort from a variety of symptoms which research has shown to be correlated with psychological stress. Symptoms which were selected for the PFIC appear in similar instruments employed by Langner (1962), Gurin, Veroff, and Feld (1960), and Myers, Lindenthal, Pepper and Ostrander (1971). The symptoms have general acceptance in the field of stress research as those most frequently associated with impaired capacity to cope with stressors.
**Format and administration.** The instrument is a single page list of sixteen physical symptoms. Two columns are provided for the subject to rank frequency (6=occurs daily; 1=not a problem) and intensity (6=extremely bothersome; 1=not a problem) for each of the symptoms. The instrument can be completed in approximately five minutes.

**Scoring.** A separate total for each column, frequency and intensity, is computed by adding the total points assigned by the subject to each symptom. In this study, the two column totals are combined in a total physical discomfort score.

**Reliability and validity.** Reliability and validity results are not available for this instrument. However, correlations between the PFIC and the two items on the SQ I which are designed to measure similar characteristics are significant. The first item - health - requires that subjects assess their physical health on a five-point Likert scale ranging from excellent to very poor. The correlation between this item and physical frequency is .37, and correlation with physical intensity is .26. The second term - physical symptoms - requires that subjects check the number of physical symptoms which they experienced in the past year. Following the pattern of the Research Diagnostic Criteria of the New York State Psychiatric Institute, attitude items such as "trouble concentrating" and "irrational fears" are included in the SQ I physical
symptoms item. Correlation between this item and physical frequency is .53, and correlation with physical intensity is .59. Higher correlations between the PFIC and the physical symptoms item result from inclusion of those anxiety-related items.

Common Beliefs Survey III (CBS III)

Description. The original survey was developed by Lane, Bessai and Bard (1975) and refined by Bessai (1976). It is based on the eleven irrational beliefs proposed by Ellis (1962). The original instrument consists of 189 items representing ten factors of irrational thinking. Final revision resulted in the CBS III (Bessai, 1977) which is a 54-item inventory with nine items for each of six factors of irrational thinking. Those factors accounted for 82.8 percent of the variance, and include importance of the past, blameworthy proneness, self-downing, need for approval, perfectionism and lack of emotional control.

Format and administration. The CBS III is self-administered requiring about fifteen minutes to complete. Items included in each of the six factors are arranged on the three-page inventory. Subjects respond on a five-point Likert-type scale ranging from "strongly agree" to "strongly disagree." Half of the items are worded as rational beliefs and half as irrational beliefs in order to discourage negative or positive response sets.
Scoring. Raw scores for the six scales are obtained by totaling the point value (1 to 5) assigned by the subject to each item, high scores indicating irrational cognitions. A total is obtained for each of the factors and the grand total is the sum of the total for all six scales.

Reliability and validity. Although little formal research has been done on this instrument, a relationship between the common beliefs which the instrument measures and physical symptomatology has been noted (Foreman, 1979; Bessai, 1977). Pilot data analysis for the present study shows a low positive correlation between most of the irrational beliefs and the two measures of stress reaction. The total score for irrational beliefs correlated .23 with trait anxiety, .24 with physical frequency, and .26 with physical intensity. A search for instruments measuring rational thinking indicates that this is the best instrument presently available.

Stress Questionnaire I (SQI)

Description. Developed by Witmer (1979), the original questionnaire which was used in this study consists of six demographic items, eighteen self-report value and attitude items, and one situational item regarding self-talk in anticipation of a potentially stressful event. Individual items on the questionnaire were selected as a result of an on-going study of the theoretical and experimental stress literature regarding the personality traits, behaviors, beliefs and attitudes of persons who successfully manage a diversity of life
stressors. Selected factors which consistently appeared to be discriminating were subsequently formulated into questionnaire items designed to measure those factors.

**Administration and scoring.** Other than the demographic items, the questionnaire requires the subject to respond on a series of Likert-type scales of varying numbers of alternatives depending on the given item. Each response alternative is phrased in a manner relevant to the belief of attitude being measured. For example, the six options for the "values" item range from "very confident" to "I don't really have any constant guiding principles," and the six options for the "optimism" item range from "very optimistic" to "very pessimistic." Subjects respond to items on the questionnaire itself and a separate score is reported for each item. No total score is computed. Total time for administration is approximately 15 minutes.

**Data Collection**

It is important to note that data for this study had already been collected as part of an on-going stress research project. The present study utilizes a part of the data from that project in order to identify and clarify some of the variables contributing to stress reactions. Specifically, data incorporated in this study were collected in the following manner:

**Seminar A.** Thirty-five subjects enrolled in the Lancaster seminar completed the battery of instruments during the first two seminar sessions.
Following administration of the instruments, students were apprised of
the theoretical and practical relevance of the instruments through
lecture and demonstration. Next, each student received four packets
containing each of the instruments and instructions were given re­
garding their administration. Instructions did not include the order
in which instruments could be given. During the ensuing week, students
administered the instruments to four out-of-class subjects in their
homes or work settings. Instruments were returned to the instructor
the following week. This researcher scored the instruments, scanned
them for validity of responses, and subjected the data to statistical
analysis.

Seminar B. Data from the 114 Athens subjects were collected by stu­
dents in the seminar, each administering four batteries of instruments
to subjects of their own choosing in the same manner as was employed
in Seminar A. This data collection was completed during the sixth to
tenth week of the course. Seminar lectures ensured that students
administering the instruments were cognizant of stress management
theory and the rationale underlying each of the instruments. Those
data were collected and scored by the instructor. Seminar students
were not included in the data due to the fact that they had already
been instructed in use of the instruments.

Seminar C. All thirty-three seminar students at Rollins College
completed the instruments during the first day, prior to the intro­
duction of information regarding the instruments themselves. Data
were collected and scored by the instructor.
All data were gathered with naive subjects. None had been instructed in the theory of stress management nor in methods for managing stress. Use of both volunteers and seminar students provided a broad range of ages, occupations, socioeconomic status and stress levels.

Pilot Data Analysis

The present study is based on the results of a pilot analysis of Seminar A data. Instruments were administered to a total of 170 subjects in that group. Twenty-five subjects were not included in the analysis. One seminar student chose not to participate, ten subjects did not complete all instruments, and instruments from fourteen subjects were judged to be invalid. Judging invalidity was accomplished by the plotting of scattergrams and identifying "outliers." Subjects who were identified as "outlying" on two or more scattergrams were eliminated. Next, the SAS statistical package (Barr, Goodnight, Sall and Helwig, 1976) was used to compute both Pearson product-moment and Spearman rho correlations on all possible combinations of variables. Results of both correlation methods were similar and the Pearson product-moment correlations are reported in this section.

The particular form of the present research is the result of the following progression of decisions.

1. The decision to move variables into criterion and predictor categories was based on a survey of the literature and practical experience in stress management. Thus, all items measuring outcome, such as physical frequency, physical intensity, health, physical
symptoms, state anxiety, and trait anxiety were determined to be criterion variables. Scores on the CBS III and the attitude and belief items from the SQ I were considered to be the predictor variables.

2. On the basis of statistical consultation, the decision was made to use only one measure of physical symptomatology as a criterion variable. The PFIC was chosen as it is the instrument most specific to measuring the outcome.

3. State anxiety was eliminated as a criterion variable as it is a transitory state.

4. Beliefs and attitudes were separated into those which are expressed about self (SQ I) and those which are general attitudes toward life and the world (CBS III).

5. Beliefs and attitudes about self which did not significantly correlate with the outcome variables were eliminated. Correlations between the remaining eight predictor variables and the criterion variables of anxiety and physical symptoms are reported in Table 5.

<table>
<thead>
<tr>
<th>Belief Item</th>
<th>Trait Anxiety</th>
<th>Physical Frequency</th>
<th>Physical Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>optimism</td>
<td>-.57</td>
<td>-.28</td>
<td>-.22</td>
</tr>
<tr>
<td>values</td>
<td>-.42</td>
<td>-.20</td>
<td>-.17</td>
</tr>
<tr>
<td>meaning</td>
<td>-.48</td>
<td>-.23</td>
<td>-.17</td>
</tr>
<tr>
<td>genuineness</td>
<td>-.34</td>
<td>-.18</td>
<td>-.19</td>
</tr>
<tr>
<td>control-good</td>
<td>-.42</td>
<td>-.18</td>
<td>-.15</td>
</tr>
<tr>
<td>control-bad</td>
<td>-.35</td>
<td>-.23</td>
<td>-.19</td>
</tr>
<tr>
<td>coping</td>
<td>-.55</td>
<td>-.42</td>
<td>-.40</td>
</tr>
<tr>
<td>pace</td>
<td>-.27</td>
<td>-.20</td>
<td>-.23</td>
</tr>
</tbody>
</table>
6. Intercorrelations between remaining Stress Questionnaire beliefs and attitudes were studied. Those which were both significantly correlated with each other statistically and which bore a theoretical relevance to one another were transformed into single variables by totaling scores. The transformation was made through the use of the Biomedical Computer Programs - P Series (BMDP, 1977) at The Ohio State University Research Center. The two resulting transformed variables and the personal beliefs and attitudes which comprise them are reported in Tables 6 and 7.

Table 6
Pilot Data Intercorrelations Between Stress Questionnaire Items which are Components of the Variable "Harmony" 
(N = 158)

<table>
<thead>
<tr>
<th>Harmony Items</th>
<th>Belief Items</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Values</td>
</tr>
<tr>
<td>values</td>
<td>1.00</td>
</tr>
<tr>
<td>meaning</td>
<td>.51</td>
</tr>
<tr>
<td>genuineness</td>
<td>.35</td>
</tr>
</tbody>
</table>
Table 7
Pilot Data Intercorrelations Between Stress Questionnaire Items which are Components of the Variable "Self-efficacy"
(N = 158)

<table>
<thead>
<tr>
<th>Self-efficacy Items</th>
<th>Control-good</th>
<th>Control-bad</th>
<th>Coping</th>
</tr>
</thead>
<tbody>
<tr>
<td>control-good</td>
<td>1.00</td>
<td>.62</td>
<td>.39</td>
</tr>
<tr>
<td>control-bad</td>
<td>.62</td>
<td>1.00</td>
<td>.41</td>
</tr>
<tr>
<td>coping</td>
<td>.39</td>
<td>.41</td>
<td>1.00</td>
</tr>
</tbody>
</table>

7. Pearson product moment correlations between data from this pilot group and data from the Ohio University stress research project were compared. Results were similar, indicating that the phenomenon being studied cut across specific samples.

The theoretical bases for grouping variables are broad. First, humanistic theory links the personal beliefs and attitudes employed in this study to positive mental health. Erikson's (1963) virtues of hope, will, purpose and competence and Jahoda's (1958) attitudes toward self, integration, autonomy and environmental mastery are all deemed necessary to anxiety-free living. Also, Rotter (1966) ties perceived control to positive mental health. The pace variable is spoken to by Toffler (1970) who warns against the physical and emotional trauma of rapid change and technology on modern-day man and woman. Finally, Ellis (1962) suggests that irrational thoughts have a cause-effect relationship with both measures of stress reaction this study employs as criterion variables.
(a) importance of the past, (b) blame-proneness, (c) self-downing, 
(d) approval, (e) perfection, and (f) control.

The result of this analysis provided the linear combination 
of X variables which was most closely linked with each of the Y 
variables. Each variable was, by this statistical manipulation, 
weighted according to its impact. The procedure provided for an 
examination of the variance in both Y variables independently and 
in combination. The purpose of such analysis was not to study each 
X variable separately for its impact on the Y variables, but to 
allow for a study of the concept of cognitive appraisal as a whole.
Statistical Analysis

All data were key punched on data cards, one card for each subject. Cards were processed in the Research Center of The Ohio State University. The BMDP (1977) Program P6M package was used to conduct a canonical correlation analysis according to the following format (Levine, 1977).

<table>
<thead>
<tr>
<th>X Variables</th>
<th>Y Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1</td>
<td>X2</td>
</tr>
</tbody>
</table>

Subject 1
Subject 2
Subject n

Figure 1. Form of Data for Canonical Analysis

X variables are:
1. trait anxiety as measured by the STAI
2. physical symptomatology as measured by a transformation of the two scores, physical frequency and physical intensity, into a single variable, physical discomfort.

Y variables are:
1. optimism
2. harmony - a transformation of three SQ I items into one variable
3. self-efficacy - a transformation of three SQ I items into one variable
4. pace
5. rational thinking - individual scores for:
CHAPTER IV
ANALYSIS OF RESULTS

Introduction

This chapter presents the results obtained in this study. First, demographic data on the subjects are presented. Second, summary data of subjects' responses to the predictor and criterion variable items are provided. Third, data pertaining to the three research questions are reported. Last, a discussion of the results of the study and a summary of the findings are presented.

Demographic Data

In order to determine whether or not the results of a research study may legitimately be generalized to a broader population, it is necessary to obtain a detailed description of the study sample. This section presents demographic data (age, sex, marital status, and social class) on the 278 subjects, out of the total of 292, who responded to all demographic items. A calculation of all possible combinations of two sexes, six marital status categories, and five social classes produced 60 cells (BMDP, 1977), each cell containing subjects of similar sex, marital status and social class. For example, subjects in two of the 60 cells might be single female managers and divorced male clerks. Collapsing the data into fewer but broader categories provided more meaningful demographic descriptions, however.
Subjects by sex and marital status. Table 8 contains 12 cells which categorize the subjects in the sample by sex and marital status.

Table 8
Summary Table: Number of Subjects by Sex and Marital Status

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Sex</th>
<th>Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>%</td>
</tr>
<tr>
<td>With Partner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cohabiting</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>Married (1)</td>
<td>59</td>
<td>47</td>
</tr>
<tr>
<td>Married (1+)</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>With Partner</td>
<td>69</td>
<td>56</td>
</tr>
<tr>
<td>Without Partner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divorced</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>Widowed</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Single</td>
<td>36</td>
<td>28</td>
</tr>
<tr>
<td>Without Partner</td>
<td>50</td>
<td>43</td>
</tr>
<tr>
<td>Totals</td>
<td>119</td>
<td>278</td>
</tr>
</tbody>
</table>

The table indicates that slightly more than half of the subjects were presently either married or cohabiting on a permanent basis, the largest group being comprised of females who were married to their first partner. The second group included males presently married to their first partner. Single females and males were the third and fourth largest groups of subjects.

Subjects by sex and social class. Before presenting a similar table depicting subjects by sex and social class, a review of Hollingshead's (1957) Two-Factor Index of Social Position which was used to calculate subjects' social class category will be provided. Hollingshead's
Index categorized occupations, his first factor, in seven broad groups: (1) higher executives and major professionals; (2) managers, proprietors of medium-sized businesses and lesser professionals; (3) administrative personnel, proprietors of small businesses and minor professionals; (4) clerical and sales workers and technicians; (5) skilled manual employees and small farm owners; (6) machine operators and semi-skilled employees; and (7) unskilled employees.

For his second factor, highest educational level attained, Hollingshead created six categories: (1) graduate or professional degree, (2) college degree or some graduate school, (3) some college, (4) high school diploma, (5) some high school, (6) children and adolescents. Using this system of classification, Hollingshead (1957) computed socioeconomic level or social class by multiplying the subjects' occupational and educational factor number by a weighting factor (seven for education and four for education) and adding the two products. The resulting factor number determined the subject's social class level. Each of the five social class levels contained a range of scores. For the purpose of this study, a new occupational category (8) was created to include adult full-time students. Consequently, Level V subjects include a sizeable student component in addition to the subjects in lower occupation and educational levels. Hollingshead's (1957) Index is contained in the Appendix, page 137.

Table 9 describes the sample by sex and social class. Total subjects in Level V included the full-time adult students whose social class was not addressed by Hollingshead's original formula. Level II subjects were most heavily represented in the total
sample, with the other four levels being approximately similar to one another. By sex, Levels II and IV females were the largest groups. Level I males outnumbered Level I females by more than two to one, and approximately the converse was true for Level II.

Table 9
Summary Table: Number of Subjects by Sex and Social Class

<table>
<thead>
<tr>
<th>Social Class Level</th>
<th>M</th>
<th>%</th>
<th>F</th>
<th>%</th>
<th>Totals</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>29</td>
<td>10</td>
<td>13</td>
<td>5</td>
<td>42</td>
<td>15</td>
</tr>
<tr>
<td>II</td>
<td>31</td>
<td>11</td>
<td>58</td>
<td>21</td>
<td>89</td>
<td>32</td>
</tr>
<tr>
<td>III</td>
<td>19</td>
<td>7</td>
<td>25</td>
<td>9</td>
<td>44</td>
<td>16</td>
</tr>
<tr>
<td>IV</td>
<td>12</td>
<td>4</td>
<td>38</td>
<td>14</td>
<td>50</td>
<td>18</td>
</tr>
<tr>
<td>V</td>
<td>28</td>
<td>10</td>
<td>25</td>
<td>9</td>
<td>53</td>
<td>19</td>
</tr>
<tr>
<td>Totals</td>
<td>119</td>
<td>42</td>
<td>159</td>
<td>58</td>
<td>278</td>
<td>100</td>
</tr>
</tbody>
</table>

Subjects by sex and age. Descriptive statistics for subjects' sex and age appear in Table 10. Five age groups were created. The first included children and adolescents. The second, or 19-25 age group, primarily included the adult students who comprised occupational category 8 and weighted Social Class V. The final three groups approximated the stages of adult life as conceptualized by Sheehy (1974). That is, the third age group, 26-35, ends with the "crossroads" or "deadline decade." The fourth, 36-45, ends with entrance into a state of equilibrium after which adults are said to renew or resign. The fifth, 46 and older, was composed of those persons whom Sheehy described as having completed the "mid-life crisis" stage." The age
range for the total subject sample was 12-86, with a mean of 31. Most subjects were in the 26-35 age group.

Table 10

Summary Table: Number of Subjects by Age and Sex

<table>
<thead>
<tr>
<th>Age Range</th>
<th>M</th>
<th>%</th>
<th>F</th>
<th>%</th>
<th>Totals</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-18</td>
<td>9</td>
<td>3</td>
<td>13</td>
<td>5</td>
<td>22</td>
<td>8</td>
</tr>
<tr>
<td>19-25</td>
<td>22</td>
<td>8</td>
<td>28</td>
<td>10</td>
<td>50</td>
<td>18</td>
</tr>
<tr>
<td>26-35</td>
<td>39</td>
<td>14</td>
<td>54</td>
<td>19</td>
<td>93</td>
<td>33</td>
</tr>
<tr>
<td>36-45</td>
<td>31</td>
<td>11</td>
<td>38</td>
<td>14</td>
<td>69</td>
<td>25</td>
</tr>
<tr>
<td>46-older</td>
<td>18</td>
<td>6</td>
<td>26</td>
<td>9</td>
<td>44</td>
<td>15</td>
</tr>
<tr>
<td>Totals</td>
<td>119</td>
<td>42</td>
<td>159</td>
<td>57</td>
<td>278</td>
<td>100</td>
</tr>
</tbody>
</table>

Mean: 33.63  Median: 31  Mode: 30  Range: 12-86  Standard Deviation: 12.74

On the basis of the preceding tables which indicate that the sample was composed of males and females from a wide range of ages, marital situations and social classes, it is concluded that the results of this study can be generalized to a broad population. Certain limitations must be noted, however. First, a sizeable adult student population was included. Second, social class of the subjects in this study was weighted toward the top two levels.

Responses to Predictor and Criterion Variables

Descriptive data on subjects' responses to the variables measured by the Stress Questionnaire I (SQ I), the Common Beliefs Survey III (CBS III), the Self-evaluation Questionnaire (STAI), and the Physical Frequency and Intensity Checklist (PFIC) are reported in
Table 11. Most subjects characterized themselves as optimistic
(mean = 4.93, scale of 1-6), and most subjects indicated that they
believed themselves to be effective at coping with stress (mean = 6.93,
scale of 1-10). Similarly, most expressed a belief that their lives
have meaning (mean = 5.08, scale of 1-6), and that their values are
right and will last (mean = 5.05, scale of 1-6). Interestingly, one of
the items comprising the harmony variable, genuineness, was responded
to in a bimodal pattern--96 subjects reported that they most often felt
phony, 100 reported that they most often felt genuine, with quite
smaller numbers reporting scores between. The result was a mean of
3.38 on a scale range of one to six. Subjects further indicated that
they perceived themselves as having more control over their good
experiences than they had over their bad ones (mean good = 3.74, mean
bad - 3.31, scale of 1-5). In responding to general irrational belief
statements, subjects tended to agree with more self-downing statements
than with other types of irrational thoughts. Self-downing scores
ranged the highest, 50, and had the largest mean, 26.86. The range of
possible scores on the CBS III is 9 to 54.

With regard to the criterion variables, subjects' mean
scores on the physical frequency scale was 32.6, and on the intensity
scale was 29.16. Possible score range on the instrument is 0 to 80.
The distribution for both physical symptom measures was slightly skewed
in the positive direction. Mean A-trait score was 36.76 with a
possible score range on the STAI of 20 to 80. A-trait scores were
normally distributed and of a narrower range than those of the physical
symptom scores.
### Table 11
Summary Table: Subjects' Responses to Predictor and Criterion Variables

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Predictor Variables</th>
<th>Range</th>
<th>Mean</th>
<th>Median</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQ I</td>
<td>Optimism</td>
<td>1-6</td>
<td>4.93</td>
<td>5</td>
<td>1.28</td>
</tr>
<tr>
<td></td>
<td>Genuineness</td>
<td>1-6</td>
<td>3.38</td>
<td>3</td>
<td>2.22</td>
</tr>
<tr>
<td></td>
<td>Meaning</td>
<td>1-6</td>
<td>5.08</td>
<td>5</td>
<td>1.30</td>
</tr>
<tr>
<td></td>
<td>Values</td>
<td>1-6</td>
<td>5.05</td>
<td>5</td>
<td>1.24</td>
</tr>
<tr>
<td></td>
<td>Coping</td>
<td>1-10</td>
<td>6.93</td>
<td>8</td>
<td>2.17</td>
</tr>
<tr>
<td></td>
<td>Control/good</td>
<td>1-5</td>
<td>3.74</td>
<td>4</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>Control/bad</td>
<td>1-5</td>
<td>3.31</td>
<td>3</td>
<td>1.06</td>
</tr>
<tr>
<td></td>
<td>Pace</td>
<td>1-3</td>
<td>1.77</td>
<td>2</td>
<td>0.62</td>
</tr>
<tr>
<td>CBS III</td>
<td>Past</td>
<td>9-37</td>
<td>22.46</td>
<td>22</td>
<td>5.95</td>
</tr>
<tr>
<td></td>
<td>Blame</td>
<td>9-41</td>
<td>21.29</td>
<td>22</td>
<td>5.65</td>
</tr>
<tr>
<td></td>
<td>Self-downing</td>
<td>9-50</td>
<td>26.86</td>
<td>27</td>
<td>6.98</td>
</tr>
<tr>
<td></td>
<td>Approval</td>
<td>9-38</td>
<td>23.42</td>
<td>23</td>
<td>5.59</td>
</tr>
<tr>
<td></td>
<td>Perfection</td>
<td>10-44</td>
<td>21.58</td>
<td>21</td>
<td>6.21</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>9-35</td>
<td>20.93</td>
<td>21</td>
<td>5.43</td>
</tr>
<tr>
<td>STAI</td>
<td>Trait anxiety</td>
<td>20-64</td>
<td>36.76</td>
<td>36</td>
<td>9.24</td>
</tr>
</tbody>
</table>

**Research Questions**

The data in this section are presented by research question. The three questions provided a focus for studying the relationship between cognitive appraisal and stress reactions.

**Question one.** Are the following personal beliefs and attitudes as measured by the SQ I characteristic of persons who cope successfully? That is, are they negatively correlated with high levels of stress reactions?

- a. being optimistic
- b. being genuine
c. having stable and lasting values
d. believing that life has meaning and direction
e. being confident on one's ability to cope
f. perceiving control over events
g. not feeling rushed

A pilot data analysis revealed correlations among the original predictor variables (a through g above) which provided a guide for their conversion into transformed variables. That is, genuineness, values and meaning not only were significantly intercorrelated in the pilot data analysis, but also were theoretically related. Therefore, a decision was made to consider them as one predictor variable which was labeled "harmony." Similarly, control of good events, control of bad events and a belief in one's ability to cope were similarly related statistically and theoretically, and were transformed into a single variable labeled "self-efficacy." Optimism and pace were treated singly. Thus, for correlational purposes, the seven personal beliefs and attitudes (a through g above) became optimism, harmony, self-efficacy and pace. Pearson product-moment correlations were computed by the SAS statistical package (Barr, Goodnight, Sall and Helwig, 1976) between scores on those transformed variables and scores of trait anxiety (STAI) and physical symptoms (PFIC). Correlations between the variables are displayed in Table 12. Significant correlations beyond the .05 level are noted.

The answer to the research question posed, whether the predictor variables of attitudes and beliefs about self were negatively correlated with the criterion variables of A-trait and physical
Table 12  
Pearson Product-moment Correlations for Transformed and Original  
Variables from the SQ I, CBS III, STAI and PFIC

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Predictor Variables</th>
<th>Optimism</th>
<th>Harmony</th>
<th>Self-efficacy</th>
<th>Pace</th>
<th>Total Irrational</th>
<th>Past</th>
<th>Blame</th>
<th>Self-downing</th>
<th>Approval</th>
<th>Perfection</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQ I</td>
<td>Optimism</td>
<td>.39</td>
<td>.48</td>
<td>.16</td>
<td>-.19</td>
<td>-.12</td>
<td>-.16</td>
<td>-.04</td>
<td>-.07</td>
<td>-.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Harmony</td>
<td>.32</td>
<td>.17</td>
<td>-.21</td>
<td>-.06</td>
<td>-.16</td>
<td>-.20</td>
<td>-.12</td>
<td>-.19</td>
<td>-.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Self-efficacy</td>
<td>.21</td>
<td>-.27</td>
<td>-.20</td>
<td>-.12</td>
<td>-.23</td>
<td>-.13</td>
<td>-.11</td>
<td>-.26</td>
<td>-.36</td>
<td>-.44</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pace</td>
<td>-.09</td>
<td>-.11</td>
<td>-.07</td>
<td>-.23</td>
<td>-.14</td>
<td>-.02</td>
<td>-.15</td>
<td>-.01</td>
<td>-.34</td>
<td>-.30</td>
<td></td>
</tr>
<tr>
<td>CBS III</td>
<td>Total Irrational</td>
<td>.68</td>
<td>.55</td>
<td>.71</td>
<td>.59</td>
<td>.67</td>
<td>.47</td>
<td>.17</td>
<td>.00</td>
<td>.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Past</td>
<td>.25</td>
<td>.39</td>
<td>.37</td>
<td>.31</td>
<td>.29</td>
<td></td>
<td>.08</td>
<td>.02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Blame</td>
<td>.18</td>
<td>.11</td>
<td>.38</td>
<td>.20</td>
<td></td>
<td></td>
<td>.05</td>
<td>.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Self-downing</td>
<td>.36</td>
<td>.47</td>
<td>.13</td>
<td></td>
<td>.00</td>
<td>.02</td>
<td>.21</td>
<td>.23</td>
<td>.00</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Approval</td>
<td>.23</td>
<td>.23</td>
<td>.29</td>
<td></td>
<td>.00</td>
<td></td>
<td>.11</td>
<td>.19</td>
<td>.00</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perfection</td>
<td>.15</td>
<td>.01</td>
<td></td>
<td></td>
<td></td>
<td>.05</td>
<td>.15</td>
<td>.01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rxx</td>
<td></td>
<td></td>
<td></td>
<td>Rxy</td>
<td>.02</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Criterion Variables</th>
<th>Physical Symptoms</th>
<th>R_{yx}</th>
<th>R_{yy}</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFIC</td>
<td>Physical Symptoms</td>
<td></td>
<td></td>
<td>.42</td>
</tr>
<tr>
<td>STAI</td>
<td>Trait Anxiety</td>
<td></td>
<td></td>
<td>.00</td>
</tr>
</tbody>
</table>

*This table is also arranged as a data matrix for canonical correlation. For an explanation, refer to the "Canonical Correlation" description on page 98.
symptoms is found in the first four rows, last two columns of Table 12. All four of the predictor variables were negatively correlated with the criterion variables \((p \leq .01)\). Self-efficacy and optimism were both negatively correlated beyond the .0001 level of significance. Lowest, but still significant, correlations were with the harmony variable \((p \leq .0004\) with A-trait and \(p \leq .0002\) with physical symptoms). Correlations between the predictor variables and criterion variables showed only slight variation. The actual .8 difference in the correlations between self-efficacy and physical symptoms and A-trait did not make a difference in the level of statistical significance \((p \leq .0001)\). In conclusion, results of the product-moment correlation performed on the data indicated that the personal beliefs and attitudes measured by the SQ I were characteristic of persons who cope successfully. All were negatively correlated with high levels of stress reactions to a significant extent.
Question two. Is irrational thinking as measured by the CBS III (Bessai, 1977) characteristic of persons who do not cope successfully? Specifically, are the following irrational beliefs positively correlated with high levels of stress reactions?

a. importance of the past in determining the present
b. a proneness to blame
c. a tendency toward self-downing
d. the need for others' approval to approve of oneself
e. a need to be perfect in all ways
f. a tendency not to be in control of one's own emotions

Table 12 also presents the data pertaining to this question. Rows five through 11, columns twelve through thirteen, provide correlations between the predictor variables of irrational beliefs and the two criterion variables. The two irrational belief factors showing highest correlations with the criteria were total (the sum of all six irrational beliefs) and self-downing. Total correlated .0001 with A-trait and .004 with physical symptoms. Self-downing correlated .0001 with A-trait and .0002 with physical symptoms. The only other factors that were significant beyond the .05 level were those correlated with A-trait (past, approval, perfection and control). Individual factors of irrational thinking other than self-downing were not significantly correlated with physical symptoms. It is concluded that irrational thinking as measured by the CBS III is, in general, significantly correlated with anxiety, but not with physical symptoms. The strong relationship between both stress reaction measures and self-downing should be noted, however.
Question three. What linear combination of the preceding cognitive appraisal variables investigated in research questions one and two is most highly correlated with stress reaction measures of trait anxiety and physical symptomatology?

In order to answer question three, it is first necessary to understand the rationale and procedures of canonical correlation. Levine (1977) has provided a detailed explanation which is summarized here. He proposed canonical correlation to be the most appropriate method for explaining more than one criterion variable by a composite set of predictor variables. The method afforded an opportunity not possible in multiple regression for examining sets of combinations of variables as occur in a multi-dimensional phenomenon.

An explanation of canonical correlation begins with labeling the two sets of variables X and Y. Each set is composed of several variables—\(X_1, X_2, \ldots X_n\) and \(Y_1, Y_2, \ldots Y_n\)—whose relationship is considered to be linear. These variables can be placed on a matrix: \(R_{XX}\) is the submatrix containing the correlations between the X variables; \(R_{YY}\) contains the correlations between the Y variables, and \(R_{XY}\) and \(R_{YX}\) both contain the correlations between each of the two sets (see Table 12). In canonical correlation, the between-set pattern is produced by replacing the original variables in the X and Y set by pairs of linear combinations of those variables. Therefore:

of the infinite number of possible linear combinations for each set, coefficients are chosen such that the resultant linear combination of the X set variables is maximally correlated with the linear combination of the Y set variables. Thus we can say that \(x\) represents that combination of the X set variables which has the highest correlation with any combination of the Y set variables, and furthermore, \(y\) is that combination of Y variables maximally
correlated with any \( X \) combination of the infinite number of linear combinations. Of the two sets of variables, we have found that particular pair most highly related to one another. The correlation coefficient between \( x \) and \( y \) is termed a canonical correlation (Levine, 1977, p. 15).

In computing a canonical correlation, more than one pair of significantly related linear combinations of variables may be found. Specifically, the method allows for computing as many significant linear combinations as are unrelated to one another, but never in excess of the number of variables in the smallest set. Each combination is composed of the linear combinations of \( x \) and \( y \) which are called canonical variates.

Formerly, canonical correlations were interpreted in light of the direct weights of each variable in the canonical variate, in order of their influence. Supression of one variable by another with which it was correlated presented a problem, however. It was observed that the second variable, when considered alone, may have contributed more to the correlation than was evident when it followed a more heavily weighted variable in the set. In order to correct for that supression, it was necessary to return to the \( R_{xx} \) and \( R_{yy} \) matrix partitions to determine by examination the extent of intercorrelations between the variable supression. Now, however, the BMDP statistical program #6M (1977) produces a canonical variate in which the effect of one variable is not supressed by another, but rather the total influence of each variable in the variate is revealed. This program was utilized in the present study.

The canonical correlation results are summarized in Table 13. Only one of the two possible pairs of canonical variates was found
to be significantly correlated. Results of a chi-square test indicated that the .48850 correlation between the first pair of variates was significant beyond the .00000 level.

Table 13
Canonical Correlations Between Cognitive Appraisal Variables and Stress Reaction Measures

<table>
<thead>
<tr>
<th>Eigenvalue</th>
<th>Canonical Correlation</th>
<th>Number of Eigenvalues</th>
<th>Chi Square</th>
<th>D F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>.23863</td>
<td>.48850</td>
<td>0</td>
<td>90.55</td>
<td>22</td>
<td>.00000</td>
</tr>
<tr>
<td>.04515</td>
<td>.21247</td>
<td>1</td>
<td>13.12</td>
<td>10</td>
<td>.21706</td>
</tr>
</tbody>
</table>

Table 14 displays the canonical variable loadings, or the computed correlations of the canonical variables with the original variables for the significant pair of canonical variates. These loaded scores prevented suppression of variance and produced the true influence of each variable in the canonical variate.

Table 14
Canonical Variable Loadings

<table>
<thead>
<tr>
<th>Criterion Variate</th>
<th>Predictor Variate</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-trait</td>
<td>0.967</td>
</tr>
<tr>
<td>Physical symptoms</td>
<td>0.704</td>
</tr>
<tr>
<td>Optimism</td>
<td>-0.771</td>
</tr>
<tr>
<td>Harmony</td>
<td>-0.490</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>-0.850</td>
</tr>
<tr>
<td>Pace</td>
<td>-0.493</td>
</tr>
<tr>
<td>Past</td>
<td>0.240</td>
</tr>
<tr>
<td>Blame</td>
<td>0.230</td>
</tr>
<tr>
<td>Self-downing</td>
<td>0.464</td>
</tr>
<tr>
<td>Approval</td>
<td>0.250</td>
</tr>
<tr>
<td>Perfection</td>
<td>0.060</td>
</tr>
<tr>
<td>Lack of Control</td>
<td>0.243</td>
</tr>
<tr>
<td>Total irrationality</td>
<td>0.379</td>
</tr>
</tbody>
</table>
An interpretation of the results entails conceptualizing the nature of each of the variates and noting which of the component variables made a strong contribution to its nature. For example, both A-trait and physical symptoms contributed significantly to the nature of the criterion variate, A-trait having the heaviest loading, .967, but with physical symptoms also showing a high loading, .704. The strongest influences on the nature of the predictor variate were the four beliefs about self from the SQ I. They exerted strong negative influence in the predictor variate's correlation with the criterion variate. Self-efficacy, -.850; optimism, -.771; pace, -.493; and harmony, -.490 were the most important influences in the variate. Only self-downing, .464, of all the irrational beliefs measured by the CBS III contributed significantly to the correlation.

Discussion

The discussion section is comprised of six parts: (1) demographic data on the sample, (2) the relationship among the predictor variables, (3) the relationship between the criterion variables, (4) the correlation between the criterion variables and the four predictor variables of attitudes and beliefs about self, (5) the correlation between the criterion variables and the six irrational belief factors, and (6) the linear combination of predictor and criterion variables.

Demographic data. Of the 292 subjects in the sample, 278 responded to the request for all demographic data. In interpreting demographic data, three aspects of the sample selection should be taken into consideration. First, the sample was weighted in the direction of the
upper two social classes (Hollingshead, 1957). The sample was particularly over-representative of females in Social Class II. Second, a large adult student population was included. Finally, age range 26-35 comprised 33 percent of the total sample. On the other hand, the sample was well-balanced by sex (57 percent females and 43 percent males), and by general marital status; for example, those living with partners and those not living with partners.

Relationship among the predictor variables. If variable loadings in the canonical correlation had not been computed, the substantial correlation between harmony, optimism, pace and self-efficacy would have prevented an accurate interpretation of the results. Computing variable loading prevented these significant intercorrelations which ranged from .17 to .48 (p < .01) from unduly interfering with accurate data interpretation. In this study, intercorrelations indicated that many subjects who believed themselves to be optimistic also believed that their values were right, that their lives had meaning, that they could generally cope well, and that they were in control of events. In short, many people described themselves positively. These subjects may be prototypic of Smith's (1966) competent young Peace Corps volunteers and Grinker's (1962) mentally healthy young men.

The six irrational belief factors were also significantly intercorrelated ranging from p < .0001 to p < .05. These results do not indicate that the factors lack discreteness, however, for Bessai's (1977) work with the instrument confirmed the independence of the factors in three sequential factor analyses. Rows and columns five
through eleven summarize the intercorrelations among the six factors and the total score for irrational thinking. Intercorrelations were highest for total score ($p < .0001$ with all six factors) due primarily to the inclusion of each of the six individual factors in arriving at the total.

In addition to identifying the six first-order factors, Bessai (1977) extracted two second-order factors—those which are broader and more central. She labeled them Evaluation and Locus of Control. Evaluation involves setting exceedingly high standards and then using those standards to evaluate self and others. The first-order factors which fall within the scope of that factor are blame, self-downing and perfectionism. In support of that concept, intercorrelations for perfectionism were highest with blame and self-downing (.47 and .38). Similarly, Locus of Control encompasses the three first-order factors of past, approval and control, and the two highest intercorrelations for control were past and approval (.29 and .23).

It appears that subjects in the present experiment tended to follow either a pattern of rating themselves and others, or giving up control of their lives to an external source. The findings support Bessai's (1977) theory of second-order factors.

Relationship between the criterion variables. The .42 ($p < .0001$) positive correlation between A-trait and physical symptoms, coupled with high loadings for both of those criterion variables in the canonical variate, indicated that most subjects in the sample experienced both anxiety and physical symptoms, a generalized stress reaction phenomenon. Researchers themselves tend to consider the
affective and physiologic reactions interchangeably. Spielberger and Sarason's series on *Stress and Anxiety* (1974-1977) included a number of papers utilizing physical symptoms as indicators of anxiety reactions. Mechanic (1976) proposed not illness but illness behavior (anxiety and "sick role") to be the result of interaction with environmental stressors. In support of that view, Pelletier (1979) reported studies of outpatient services in which as high as 20 percent of the patients were what he called the "worried well." In sum, the .42 correlation is not an isolated finding but is supported by theoretical and clinical studies.

**Correlations between predictor variables of attitudes and beliefs about self (SQ I) and criterion variables.** Results of all product-moment correlations between attitudes and beliefs about self, as measured by the SQ I, and A-trait and physical symptoms were significant beyond the .01 level. The results support the hypothesis that cognitive appraisal variables discriminate between people who experience stress reactions and people who do not. Previous research suggested that subjects perceived their symptoms globally, and those who experienced anxiety also indicated the presence of a greater number of physical symptoms when presented with a physical symptom checklist (Brown, 1974; Bradburn and Kaplovitz, 1965; Tessler and Mechanic, 1978). The present study supports those findings, but was unique in that each factor--anxiety and physical symptomatology--was measured by a separate instrument. Most earlier studies utilized checklists containing both affective and physiological items.
A belief in one's ability to control the events in one's life and to cope successfully, labeled self-efficacy, was most significantly correlated with low levels of stress reactions (-.44 and -.36). Murphy's (1960) studies with children and Silber's (1961) study of adolescents concluded similarly. Bandura (1971) proposed that an "efficacy expectation" intervenes in the stress interaction and when it is positive the expectation is linked to psychological well-being through a process of "reciprocal determinism."

The second most highly correlated variable was optimism (-.37 and -.36). Persons who reported that they anticipated positive outcomes did not exhibit the higher levels of trait anxiety and physical symptoms as were typical of those whose anticipations were more negative. Lazarus (1979) noted that competent copers employ many strategies in reducing stress reactions, one of which is positive denial or hope. Results of a wide variety of field and laboratory studies support the finding that optimism is associated with successful interaction with, and positive recovery from, stressors.

Pace, the belief that one is not overly rushed, produced the third highest correlations with the criterion variable (-.34 and -.30, \( p \leq .0001 \)). A causal relationship between rapid and frequent change, a hard-driving lifestyle, and the onset of stress reactions has been well-documented (Holmes and Rahe, 1967; Friedman and Rosenman, 1974). Levi and Andersson (1975) proposed that optimum mental health is congruent with a satisfactory balance between over- and under-stimulation.

The fourth variable which was associated with low levels of stress reactions was harmony, or a belief in the rightness of one's
values, the purpose and direction of one's life, and one's genuineness as a person. Correlations between this variable and the criterion measures were lower than that of the other predictor variables in this transformed variable (-.22 and -.21), but were still significant (p < .01). Humanistic psychology traditionally has advocated the centrality of harmony in the encouragement of and therapeutic intervention in the development of positive mental health. Relatedly, Goble (1976) documented research on the relationship of a feeling of harmony to psychological and physical well-being.

Correlations between the predictor variables of irrational thinking (CBS III) and the criterion variables. Although cognitive theorists have proposed that irrational thinking is a crucial determinant in the development of affective and physical symptomatology (Ellis, 1962; Beck, 1970; Meichenbaum, 1977), correlations between the present irrational thinking factors and stress reaction measures were less significant than the beliefs measured by the SQ I. Only self-downing was significantly correlated with both of the criterion variables (.21 and .23, p < .01). That is, subjects who engaged in negative self-evaluative cognitions were likely to experience stress reactions. On the other hand, subjects who engaged in other types or irrational thinking, e.g., importance of the past, need for perfection, lack of control, indicated that they experienced anxiety but not discomforting physical symptoms.

Several explanations could be offered for the less significant correlations between the majority of the irrational beliefs and
the stress reaction measures. Unlike the attitudes and beliefs measured by the SQ I, the beliefs measured by the CBS III were not statements about self, but about people in general. Subjects were not required to explore their attitudes toward themselves. In addition, some instruments were returned by subjects with expressions of annoyance and anger at having been asked to respond to "the same statement over and over." The format of the CBS III is such that each of the six factors of irrational thinking is phrased in nine different ways. A negative attitude toward the instrument itself also could have biased the results. A third explanation is that the process of cognitive appraisal as it operated in the stress interaction involves assessing one's own resources. It is proposed that stress reactions vary as the ratio of the degree of threat and the appraisal of one's own personal resources to deal with it. The CBS III does not address this dimension of cognition, but is directed at measuring the content of irrational thinking itself. Finally, the link between irrational thinking and stress reactions may not be so much a function of specific thought content as it is of irrational thought process. Bessai (1977) made the point that the purpose of the CBS III was to measure irrational thought content. Unlike the SQ I to which global responses were made, the CBS III responses were content specific.

Combination of predictor and criterion variables. Employing the canonical correlation procedure afforded an opportunity to examine two sets of combinations of variables—predictor and criterion. In regard to the predictor variate, which was composed of the four beliefs and attitude about self and the six irrational belief factors,
self-efficacy emerged as the most important predictor variable with optimism contributing a nearly-equal effect. The third most heavily loaded variable was pace. Also of significance in predicting the criterion variable correlation were harmony and self-downing, with the five remaining irrational beliefs contributing negligibly to the nature of the variate. Feeling harmonious and negatively evaluating oneself were equally important in the variate.

The extent to which an absence of the effect of a given variable determines the nature of the predictor variate as indicated by placing a minus sign in front of the loading number. Thus the absence of a belief in self-efficacy, optimism, satisfactory pace, harmony and the presence of self-downing statements were, in that order, positively correlated with the criterion variate.

The preceding section of this chapter which dealt with canonical correlation pointed out that the procedure allows for finding more than one pair of significantly related combinations of variables. In the present study, however, only one of the two possible pairs of variates was significantly related. The decision to combine single variables into transformed variables on the basis of a pilot data analysis may have been responsible for the highly significant results obtained for the first pair, $p < .00000$, thus preventing a second combination of variables from emerging.

**Summary**

The major findings of this study are:

1. The personal beliefs and attitudes measured by the SQ I were found to be negatively correlated with high levels of stress
reaction. Self-efficacy, optimism, satisfactory life pace and harmony, in that order, were significantly correlated with trait anxiety and physical symptomatology beyond the .01 level.

2. One factor of irrational thinking as measured by the CBS III was found to be significantly correlated with both of the criterion variables. That factor was self-downing, correlated .21 with A-trait and .23 with physical symptoms. Four of the other factors of irrational thinking were significantly correlated with anxiety, but not with physical symptoms: past (p < .02); approval (p < .01); perfection (p < .01); and control (p < .02).

3. The linear combination of the two canonical variates was significant beyond the .00000 level. Results of the canonical correlation revealed that five of the predictor variables were important in the relationship between the predictor and criterion variates. In descending order of influence, those significant predictor variables were:

- self-efficacy ............ negatively correlated with criterion
- optimism ..................... negatively correlated with criterion
- satisfactory life pace ........ negatively correlated with criterion
- harmony ......................... negatively correlated with criterion
- self-downing ............. positively correlated with criterion
CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Included in this chapter are a summary of the research study, the findings and the conclusions. Recommendations are provided for further stress research.

Summary

A brief summary is presented as background for the conclusions and recommendations which follow. Included are a statement of the problem, procedures and findings.

Statement of the problem. What persons say to themselves in anticipating potentially stressful situations may have the power to enhance or diminish the quality of their lives. Unwanted, unnecessary and even debilitating psychological and physiological reactions may occur as a result of self-talk engaged in on the basis of negative and/or illogical attitudes and beliefs about self and world. If preventative measures and therapeutic interventions are to be effective, knowledge of the particular cognitions which are associated with high and low levels of stress reaction needs to be acquired. This study was undertaken to investigate the problem by determining what relationships exist between cognitive appraisal variables which mediate in stress and two measures of the stress reaction, trait anxiety and physical symptomatology.
Three research questions were posed:

1. Are the following personal beliefs and attitudes characteristic of persons who cope successfully? They are: being optimistic, feeling genuine, having stable and lasting values, believing that life has meaning and direction, being confident in one's ability to cope, perceiving control over events, and not feeling rushed.

2. Is irrational thinking characteristic of persons who do not cope successfully? Specific beliefs are: importance of the past in determining the present, proneness to blame, a tendency toward self-downing, the need for others' approval to approve of oneself, and a need to be perfect in all ways.

3. What linear combination of the preceding cognitive appraisal variables is most highly correlated with stress reaction measures of trait anxiety and physical symptoms?

Procedures. Data were gathered during Spring and Summer Quarters, 1979 in three graduate seminars addressing the general topic of stress management. Seminar A subjects included students and volunteers from the Lancaster Branch, Ohio University seminar. Seminar B subjects included volunteers surveyed by students in the main campus, Ohio University seminar. Seminar C subjects included students in the Rollins College seminar. The 292 subjects included 67 students and 225 volunteers, demographically described as 119 males and 159 females ranging in ages from 12 to 86. Discrepancies in totals are the result of all subjects not responding to the demographic items.

Four instruments were administered to the subjects: Stress Questionnaire I (SQ I; Witmer, 1979), Common Beliefs Survey III
CBS III; Bessai, 1977), Physical Frequency and Intensity Checklist (PFIC; Witmer, 1977), and Self-Evaluation Questionnaire (STAI; Speilberger, Gorsuch and Lushene, 1970). Predictor variables, which were proposed to be cognitive intervening variables in the stress interaction, were measured by the SQ I and the CBS III. The SQ I instruments provided the personal belief and attitude variables and the CBS III provided the factors of irrational thinking. The STAI and the PFIC provided measures of the criterion variables, or stress reactions, trait anxiety and physical symptomatology.

Two statistical treatments were applied to the data: (1) Pearson product-moment correlations were calculated between the personal beliefs and attitudes and the criterion variables, and between the factors of irrational thinking and the criterion variables (Barr, Goodnight, Sall and Helwig, 1975). (2) A canonical correlation analysis was computed between the criterion and predictor variables (BMDP, 1977).

Findings. An analysis of the data generated the following findings:

1. The proposed beliefs and attitudes measured by the SQ I which were proposed to mediate between stress appraisal and stress reactions were found to be characteristic of persons who coped well with stress when coping was defined as low trait anxiety and physical symptomatology. Self-efficacy, optimism, satisfactory life pace and harmony all were significantly correlated with both trait anxiety and physical symptomatology ($p < .001$).

2. Irrational thinking as measured by the CBS III was found to be characteristic of persons who experienced anxiety. Correlations
with A-trait were: importance of the past ($p < .02$), need for approval ($p < .001$), perfectionism ($p < .01$) and lack of emotional control ($p < .02$). However, no relationship was found between five of the six irrational belief factors and physical symptomatology. Only self-downing, which was the single factor not directly related to a specific irrational belief (Ellis, 1962) was significantly correlated with both of the stress reaction measures: .21 with physical symptoms and .23 with trait anxiety ($p < .001$).

3. The linear combinations of cognitive appraisal variables and stress reaction measures produced two canonical variates which were significantly correlated with each other beyond the .00000 level. Results indicated that the absence of a feeling of self-efficacy, the absence of optimism, the absence of a sense of satisfactory life pace, the absence of a feeling of harmony, and indulgence in self-downing statements were related, in that weighted order, to the variate comprised of trait anxiety and physical symptomatology. Trait anxiety contributed most significantly to the criterion variate's correlation with the linear combination of predictor variables, but physical symptoms also contributed heavily.

Conclusions

The purpose of the study was to determine the relationship between specific cognitive appraisal variables and stress reactions. To that end, certain personal beliefs and attitudes were measured, rational thinking was assessed, and a combination of those variables was calculated in relation to measures of stress reactions. Results of those procedures suggested that persons who cope successfully with
stress can be differentiated from persons who do not cope on the basis of the cognitions which they employ. Specifically, the following conclusions can be drawn:

1. Differences exist in the level of anxiety and physical symptomatology of persons who believe and those who do not believe, that they are efficacious, who look to the future optimistically, who believe that their lives are harmonious, and who hold the attitude that they are not overly rushed. It can be concluded that the beliefs that one holds and the symptoms which one experiences are related. Furthermore, the particular cognitions which are related are those positive attitudes and beliefs which humanistic psychologists espouse as being central to positive mental health. The significant relationship suggests that cognitions may be the crucial variables in the stress interaction as Lazarus (1966, 1974) hypothesized.

2. The proposals of certain semantic theorists linking irrational thinking to physiological symptomatology were not supported. Only the self-downing factor, or irrational self-evaluative thought, was significantly related to both physical symptoms and anxiety. Like the personal beliefs and attitudes measured by the SQ I, items comprising this factor focused on self, and measured the extent to which subjects agreed with self-downing statements. It appears that not irrational thinking in general but the specific irrational content of negative self-evaluation may be critical in the stress interaction. Lazarus (1966) proposed that the appraisal which intervenes between stressor and stress reaction consists of assessing one's own resources in relation to the threat posed by the stressor. Finding a significant positive correlation between self-downing self-statements and stress
reactions supports Lazarus' view. On the other hand, importance of the
past, the need for approval, perfectionism, and lack of emotional
control were significantly related to only one stress reaction—anxiety.
The fact that most of the irrational beliefs measured by the CBS III
did not correlate significantly with physical symptoms may indicate a
unique relationship between the specific content of the beliefs and
specific stress reactions. Lazarus (1966) stated that although general
beliefs about the environment and about one's ability to deal with it
probably underlie chronic anxiety, one should not expect high agreement
among all indicators of stress reaction. Each indicator reflects the
specific person-environment interaction and researchers may learn more
about specific transactions when indicators do not agree.

3. Trait anxiety and physical symptoms are clearly related. In most persons who experience stress reactions, the affective response
is more prevalent but both are crucial in determining the nature of a
stress reaction. Therefore, symptom checklists employing a combination
of affective and physiological items are a legitimate vehicle for as­
sessing stress-related complaints.

4. Combining significantly intercorrelated and theoretically
congruent variables into transformed variables accommodated comparison
between broader attitudes about self and stress reactions. Thus, more
meaningful correlations were produced. For example, in creating the
self-efficacy variable, the individual variables measuring the atti-
tudes of "self in control of good events" and "self in control of bad
events," and "self as effective coper" were meaningfully combined. It
is concluded on the basis of a comparison of pilot data analysis (in
which variables were not transformed) and the final study (in which variables were transformed) that the latter procedure produced more meaningful and stronger relationships between cognitions and stress reactions.

5. If persons can be defined by their attitudes, beliefs and thoughts, then it is concluded that copers can be defined on the basis of the canonical predictor variate produced by this study. That is, copers are those persons whose cognitive structure characteristically assesses self positively and satisfactorily.

6. It is also concluded that the general nature of the cognitive structure of persons who cope well with stress can be qualitatively and quantitatively described. Results of the canonical correlation, which produced a hierarchy of cognitions as they were significantly related to another hierarchy of stress reaction symptoms, indicated the relative importance of eleven cognitive intervening variables. The strength of the canonical procedure is that it affords an opportunity to study the nature of the cognitive phenomenon of copers may have been significantly \( p < .00000 \) determined. Analogous to writing a formula for physical compound, one may in a sense deduce the formula for coping cognitions on the basis of the output of the loaded canonical variate (Table 14).

**Recommendations for Future Research**

The following recommendations are based on the results of data analysis and the limitations of the present study.

1. Subjects in the present study were primarily upper-middle
class Caucasians. Future research needs to be conducted with other populations.

2. Two variables, optimism and pace, were measured on the basis of only one item on the SQ I, unlike the transformed variables which included three component items and the CBS III which contained nine items for each variable. It is recommended that for further research additional items be created to measure those two variables as they proved to be significant in the results.

3. Two instruments, the SQ I and the PFIC, have not been validated. Furthermore, there is scanty validation for the CBS III. Future research should establish evidence regarding the validity of those instruments.

4. It is recommended that instruments measuring the stress reaction of depression, for example, be added to the battery already in use. It is possible that the hierarchy of cognitive appraisal variables in the predictor variate might differ when correlated with alternate or additional stress reaction measures.

5. Predictor variables such as confidence in one's social support system, faith in a higher being, and attitudes toward the use of one's leisure time would contribute to a more comprehensive understanding of cognitive appraisal. Much of the literature revealed the importance of those factors in the control of stress reactions.

6. The SQ I attempted to assess anticipatory self-talk through items requiring subjects to report what they said to themselves prior to and during a stressful situation. Written responses were inconclusive for the most part. It is recommended that the interview
method be employed in future data-gathering, not only to assess the positive or negative nature of anticipatory self-talk, but also to validate the items on the SQ I.

7. Some specific beliefs and attitudes may be more characteristic of a particular age, sex, marital status or social class. Retaining the "cells" which were created to describe subjects demographically, future researchers might discover that specific personal beliefs, attitudes and thoughts are more characteristic of one subgroup of subjects than of another.

8. Most research has focused on the emotional and behavioral correlates of physical symptoms, not the belief correlates. It is recommended that more research be conducted specifically with the CBS III and the PFIC, or generally between physical symptoms and the content of specific irrational thinking.

9. Based on the assumption that the presence of stress reactions implies an antecedent stressor, the present study did not employ any specific stressors. A study employing the SQ I and the CBS III in an experimental design utilizing a specific stressor should be undertaken in order to determine if similar results would be found.
APPENDIXES
Physical Frequency and Intensity Checklist (PFIC)
SELECT THE INTENSITY GRADE AND FREQUENCY GRADE THAT REFLECTS YOUR PRESENT DIFFICULTY WITH EACH COMPLAINT LISTED BELOW.

<table>
<thead>
<tr>
<th>FREQUENCY GRADES</th>
<th>INTENSITY GRADES</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 - occurs daily</td>
<td>5 - extremely bothersome when occurs</td>
</tr>
<tr>
<td>4 - occurs several times a week</td>
<td>4 - severely bothersome when occurs</td>
</tr>
<tr>
<td>3 - occurs about once a week</td>
<td>3 - moderately bothersome when occurs</td>
</tr>
<tr>
<td>2 - occurs about once a month</td>
<td>2 - slightly bothersome when occurs</td>
</tr>
<tr>
<td>1 - not a problem</td>
<td>1 - not a problem</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Complaint</th>
<th>Frequency Grade</th>
<th>Intensity Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>headaches</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>backaches</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>gastric ulcer</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>stomach pain</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>asthma</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>spastic colitus</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>insomnia</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>high blood pressure</td>
<td>_____</td>
<td>_____</td>
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<tr>
<td>fatigue</td>
<td>_____</td>
<td>_____</td>
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<tr>
<td>nausea</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>general stiffness</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>heart palpitation</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>eye pain associated with reading</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>diarrhea</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>constipation</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>dizziness</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>other:</td>
<td>__________________________</td>
<td>_____</td>
</tr>
</tbody>
</table>
Common Beliefs Survey III
(CBS III)
Common Beliefs Survey III

This survey is comprised of a number of statements with which you will tend to agree or disagree. Please indicate on the answer sheet your reaction to each statement by placing a number that best represents your response.

This Survey developed and researched by Bessai (1977; 1978)
1. A person's present behavior must be greatly influenced by his/her past.
2. There is a right way to do everything.
3. One can't help getting down on oneself when one fails at something.
4. Being approved by others is very important.
5. Criminals are basically bad people and should be punished.
6. Unhappiness comes from inside oneself.
7. If people don't meet their own standards, they are bound to think less of themselves.
8. No one is evil, even though his deeds may be.
9. Something that once strongly influenced one's life need not determine one's feelings now; it may because one's past is not all-important.
10. People and things often contribute to our problems, and it is awful if one's problems are one's life's hassles.
11. How a person feels about himself is important.
12. People in general are not very moral.
13. It is not right to expect people to be perfect.
14. People are generally not very responsible.
15. One can't expect others to be perfect.
16. Always being oneself is very important.
17. Failure is a normal part of life.
18. People try to change themselves only if they feel it is necessary.
19. One cannot control what happens to one.
20. Human unhappiness is often the result of one's lack of ability to control oneself.
21. Past experiences need not control one's behavior.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
22. Criticism is bound to make anyone very nervous and anxious.
23. One must be perfectly competent, adequate, and achieving to consider oneself worthwhile.
24. Certain people are bad or wicked and should be severely blamed and punished for their sins.
25. Being ignored by friends doesn't have to be upsetting.
26. If someone does one wrong, then one should think less of that person.
27. If a person wants to, he/she can be inconsiderate most circumstances.
28. A person can't help feeling that way.
29. For most questions, the influence really changed.
30. People make mistakes.
31. It is awful to watch them to handle them.
32. Having them to handle them is necessary.
33. People are sometimes wrong.
34. There is no necessary.
35. There is no necessary.
36. The past is depressingly.
37. The main goal is the.
38. There is no structure.
39. People who do wrong things.
40. One's own deficiencies and shortcomings are naturally depressing.
41. People can control their emotions.
42. It is better to obtain one's own self-respect, rather than securing other people's approval.

43. Something that once strongly influenced one's life determines one's feelings and behavior today because one's past remains all-important.

44. People can live comfortably whether other people like them or not.

45. Any job should be done thoroughly and perfectly if it is done at all.

46. It doesn't make much sense to think that certain people are bad or wicked and should be severely blamed and punished for their sins.

47. People make mistakes when they are approved by every one.

48. Not every solution to a problem is approved by every one.
Stress Questionnaire I
(SQ I)
STRESS QUESTIONNAIRE

1. What is your age? _____

2. What is your sex? Male_____ Female_____ 

3. What is your current marital status?
   ____ Single
   ____ Married, first time
   ____ Married, more than once
   ____ Divorced or separated
   ____ Widowed
   ____ Cohabiting on a long term basis

4. What level of education have you completed?
   ____ Grade school or less
   ____ Some high school
   ____ High school diploma
   ____ Some college
   ____ College degree
   ____ Some graduate school
   ____ Graduate or professional degree

5. What is your occupation? Please specify exact occupation.

6. On the following ladder, list the order in which you, your brothers, and your sisters were born. Use a B for brother, S for sister, and an X for yourself. Put twins on the same line. Indicate year of birth for each person.
   ___ First born
   ___ Second born
   ___ Third born
   ___ Fourth born
   ___ Other middle siblings
   ___ Last born

7. In general how would you rate your physical health over the last year?
   ____ Excellent
   ____ Good
   ____ Fair
   ____ Poor
   ____ Very poor

8. Which of the following have been true of you in the past year? Check all that apply.
   ____ Frequent headaches
   ____ Stomach ulcers
   ____ High blood pressure
   ____ Insomnia
   ____ Nightmares
   ____ Constant worry and anxiety
   ____ Chronic and recurring diarrhea
   ____ Tiring easily
   ____ Trouble concentrating
   ____ Often feel guilty
   ____ Sometimes feeling that you just can't go on
   ____ Irrational fears
   ____ Crying spells
   ____ Often feeling lousy
   ____ Being considerably overweight
   ____ Being considerably underweight
   ____ Lack interest in sex
   ____ Feelings of worthlessness
   ____ Irregular or painful menstrual periods
9. How well do you get along with most of your coworkers?

____ Very well
____ Moderately well
____ Neutral
____ Not very well
____ Definitely not at all well
____ Not applicable

10. If you have a boss or immediate supervisor, how well do you get along with him or her?

____ Very well
____ Moderately well
____ I'm neutral toward this person
____ Not very well
____ Definitely not at all well
____ Not applicable

11. In Aesop's fable "The Ant and the Grasshopper," the ant spent his time working and planning for the future, while the grasshopper lived for the moment and enjoyed himself. Which are you more like?

____ The ant
____ The grasshopper

12. How much do you agree or disagree with statements 12 to 15? Use the following scale to answer:

1 Strongly disagree
2 Moderately disagree
3 Slightly disagree
4 Slightly agree
5 Moderately agree
6 Strongly agree

12. I like most of the people I meet.

1 2 3 4 5 6

13. I feel like my life has meaning and direction.

1 2 3 4 5 6

14. I often feel like a phony or fraud.

1 2 3 4 5 6

15. The best way to handle people is to tell them what they want to hear.

1 2 3 4 5 6

16. How do you feel about the pace of your life?

____ Always feel rushed
____ Sometimes feel rushed
____ Almost never feel rushed
17. How confident are you that your guiding values are right for you and will last?

___ Very confident
___ Considerably confident
___ Somewhat confident
___ Not at all confident
___ I'm questioning my values constantly
___ I don't really have any constant guiding principles

18. How optimistic or pessimistic about your life would you say you are?

___ Very optimistic
___ Moderately optimistic
___ Slightly optimistic
___ Slightly pessimistic
___ Moderately pessimistic
___ Very pessimistic

19. When you begin the day, do you generally anticipate that it will be:

___ Very satisfying
___ Moderately satisfying
___ Neither satisfying nor unsatisfying
___ Moderately unsatisfying
___ Very unsatisfying

20. In your opinion how much control do you have over the good or pleasant things that happen to you?

___ Almost total control
___ Mostly under my control
___ About half the time I can control the good things
___ Mostly not under my control
___ Almost no control

21. In your opinion, how much control do you have over the bad or unpleasant things that happen to you?

___ Almost total control
___ Mostly under my control
___ About half the time I can control the bad things
___ Mostly not under my control
___ Almost no control

22. The situations, events, expectations, or demands in my life which are the greatest source of stress or tension are:


Now rank the above by putting a 1 beside the one that causes the most stress, a 2 for that which is second and so on with the others you have listed.
23. Most of the stress in my life (check one of the following):

_____ Comes from outside myself and I have little or no control over it or its consequences.
_____ Comes from outside myself and I have some control over it and its consequences.
_____ Comes from inside myself as well as outside myself and I have little or no control over it and its consequences.
_____ Comes from inside myself as well as outside myself and I have some control over it and its consequences.
_____ Comes from inside myself and I have little or no control over it and its consequences.
_____ Comes from inside myself and I have some control over it and its consequences.

24. Compared to you, how stressed are most of your acquaintances?

_____ Much more stressed than I
_____ Somewhat more stressed than I
_____ About as stressed as I
_____ Somewhat less stressed than I
_____ Much less stressed than I

25. To what extent do you attribute the following factors to your being able to cope with stress in your life? Use a total of 100 points to assign a value to the four factors:

_____ Ability
_____ Effort
_____ Task difficulty (The level of difficulty of the tasks are within my capability to complete them)
_____ Luck

26. List the ways you have of coping with stress in your life (Be as specific as you can):

27. Think of an event or situation that is coming up and is likely to create some stress or tension in your life. What are your thoughts and self-talk as you anticipate the situation? That is, what do you think and see in your own mind regarding yourself and the situation?

a. List the event or situation (Be as specific as you can):
b. What are you saying to yourself as you think of the future situation?

c. What do you usually say to yourself as you anticipate a situation that is likely to create some tension or stress?

28. Think of a stressful event or situation that you experienced in the last year. What were your thoughts and self-talk while you were experiencing the situation? That is, what were you thinking and feeling during the stressful event?

   a. List the event or situation (Be as specific as you can):

   b. What were you saying to yourself during the event?

   c. What do you usually say to yourself as you are experiencing an event that is stressful?

29. Think again of the event or situation identified in No. 28 above.

   a. After the event or situation was over, what did you say to yourself about the event?
b. What do you usually say to yourself after an event that was stressful?

30. How would you rate your overall ability to cope with stress?

<table>
<thead>
<tr>
<th>Highly Inadequate</th>
<th>Highly Adequate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
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</tbody>
</table>
Self-Evaluation Questionnaire
(STAI)
# SELF-EVALUATION QUESTIONNAIRE

## STAI FORM X-2

**NAME**  
**DATE**

**DIRECTIONS:** A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

<table>
<thead>
<tr>
<th><strong>Statement</strong></th>
<th><strong>ALWAYS</strong></th>
<th><strong>SOMETIMES</strong></th>
<th><strong>FREQUENTLY</strong></th>
<th><strong>NEVER</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>21. I feel pleasant</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
</tr>
<tr>
<td>22. I tire quickly</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
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<tr>
<td>23. I feel like crying</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
</tr>
<tr>
<td>24. I wish I could be as happy as others seem to be</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
</tr>
<tr>
<td>25. I am losing out on things because I can’t make up my mind soon enough</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
</tr>
<tr>
<td>26. I feel rested</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
</tr>
<tr>
<td>27. I am “calm, cool, and collected”</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
</tr>
<tr>
<td>28. I feel that difficulties are piling up so that I cannot overcome them</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
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<tr>
<td>29. I worry too much over something that really doesn’t matter</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
</tr>
<tr>
<td>30. I am happy</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
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<tr>
<td>31. I am inclined to take things hard</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
</tr>
<tr>
<td>32. I lack self-confidence</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
</tr>
<tr>
<td>33. I feel secure</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
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<tr>
<td>34. I try to avoid facing a crisis or difficulty</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
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<tr>
<td>35. I feel blue</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
</tr>
<tr>
<td>36. I am content</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
</tr>
<tr>
<td>37. Some unimportant thought runs through my mind and bothers me</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
</tr>
<tr>
<td>38. I take disappointments so keenly that I can’t put them out of my mind</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
</tr>
<tr>
<td>39. I am a steady person</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
</tr>
<tr>
<td>40. I get in a state of tension or turmoil as I think over my recent concerns and interests</td>
<td><img src="image" alt="Circle 1" /></td>
<td><img src="image" alt="Circle 2" /></td>
<td><img src="image" alt="Circle 3" /></td>
<td><img src="image" alt="Circle 4" /></td>
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The Two-Factor Index of Social Position
THE TWO-FACTOR INDEX OF SOCIAL POSITION

I. Introduction.

The Two-Factor Index of Social Position was developed to meet the need for an objective, easily applicable procedure to estimate the positions individuals occupy in the status structure of our society. Its development was dependent both upon detailed knowledge of the social structure, and procedures social scientists have used to delineate class position. It is premised upon three assumptions: (1) the existence of a status structure in the society; (2) positions in this structure are determined mainly by a few commonly accepted symbolic characteristics; and (3) the characteristics symbolic of status may be scaled and combined by the use of statistical procedures so that a researcher can quickly, reliably, and meaningfully stratify the population under study.

Occupation and education are the two factors utilized to determine social position. Occupation is presumed to reflect the skill and power individuals possess as they perform the many maintenance functions in the society. Education is believed to reflect not only knowledge, but also cultural tastes. The proper combination of these factors by the use of statistical techniques enable a researcher to determine within approximate limits the social position an individual occupies in the status structure of our society.
II. The Scale Scores.

To determine the social position of an individual or of a household two items are essential: (1) the precise occupational role the head of the household performs in the economy; and (2) the amount of formal schooling he has received. Each of these factors are then scaled according to the following system of scores.

A. The Occupational Scale.

1. Higher Executives, Proprietors of Large Concerns, and Major Professionals.


   Bank Presidents; Vice-Presidents Judges (Superior Courts)
   Large Business, e.g., Directors, Presidents, Vice-Presidents,
   Assistant Vice-Presidents, Executive Secretary,
   Treasurer.
   Military, Commissioned Officers, Major and above, Officials of
   the Executive Branch of Government, Federal, State,
   Local, e.g., Mayor, City Manager, City Plan Director,
   Internal Revenue Directors Research Directors, Large Firms

   b. Large Proprietors (Value over $100,000\(^1\)).

      Brokers Dairy Owners
      Contractors Lumber Dealers

   c. Major Professionals

      Accountants (C. P. A.) Economists
     Actuaries Engineers (College Graduate)
     Agronomists Foresters
     Architects Geologists
     Artists, Portrait Lawyers
     Astronomers Metallurgists
     Auditors Physicians
     Bacteriologists Physicists, Research
     Chemical Engineers Psychologists, Practicing
     Chemists Symphony Conductor
     Clergyman (Professionally Trained) Teachers, University, College
     Dentists Veterinarians (Veterinary Surgeons)

1. The value of businesses is based upon the rating of financial strength in Dun and Bradstreet's Manual.

a. Business Managers in Large Concerns.

Advertising Directors
Branch Managers
Brokerage Salesmen
District Managers
Executive Assistants
Executive Managers, Govt. Officials, minor, e.g., Internal Revenue Agents
Farm Managers

Office Managers
Personnel Managers
Police Chief; Sheriff
Postmaster
Production Managers
Sales Engineers
Sales Managers, National Concerns
Sales Managers (Over $100,000)

b. Proprietors of Medium Businesses (Value $35,000 to $100,000)

Advertising Owners (-$100,000)
Clothing Store Owners (-$100,000)
Contractors (-$100,000)
Express Company Owners (-$100,000)
Fruits, Wholesale (-$100,000)
Furniture Business (-$100,000)
Jewelers (-$100,000)
Labor Relations Consultants

Manufacturer's Representatives
Poultry Business (-$100,000)
Purchasing Managers
Real Estate Brokers (-$100,000)
Rug Business (-$100,000)
Store Owners (-$100,000)
Theater Owners (-$100,000)

Accountants (Not C. P. A.)
Chiropodists
Chiropractors
Correction Officers
Director of Community House
Engineers (Not College Graduate)
Finance Writers
Health Educators
Librarians

Military, Commissioned Officers, Lts., Captains
Musicians (Symphony Orchestra)
Nurses
Opticians
Pharmacists
Public Health Officers (M. P. H.)
Research Assistants, University (Full-time)
Social Workers
Teachers (Elementary and High)


a. Administrative Personnel

Adjusters, Insurance
Advertising Agents
Chief Clerks
Credit Managers
Insurance Agents
Managers, Department Stores
Passenger Agents -- R.R.
Private Secretaries
Purchasing Agents

Sales Representatives
Section Heads, Federal, State, and Local Government Offices
Section Heads, Large Businesses and Industries
Service Managers
Shop Managers
Store Managers (Chain)
Traffic Managers
b. **Small Business Owners** ($6,000-$35,000)

| Art Gallery | Glassware |
| Auto Accessories | Grocery-General |
| Bakery | Hotel Proprietors |
| Beauty Shop | Inst. of Music |
| Boatyard | Jewelry |
| Brokerage, Insurance | Machinery Brokers |
| Car Dealers | Manufacturing |
| Cattle Dealers | Monuments |
| Cigarette Machines | Package Store (Liquor) |
| Cleaning Shops | Painting Contracting |
| Clothing | Plumbing |
| Coal Businesses | Poultry Producers |
| Convalescent Homes | Publicity & Public Relations |
| Decorating | Real Estate |
| Dog Supplies | Records and Radios |
| Dry Goods | Restaurant |
| Electrical Contractors | Roofing Contractor |
| Engraving Business | Shoe |
| Feed | Shoe Repairs |
| Finance Co., Local | Signs |
| Fire Extinguishers | Tavern |
| 5 & 10 | Taxi Company |
| Florist | Tire Shop |
| Food Equipment | Trucking |
| Food Products | Trucks and Tractors |
| Foundry | Upholstery |
| Funeral Directors | Wholesale Outlets |
| Furniture | Window Shades |

c. **Semi-Professionals**

| Actors and Showmen | Morticians |
| Army M/Sgt; Navy C.P.O | Oral Hygienists |
| Artists, Commercial | Photographers |
| Appraisers (Estimators) | Physio-therapists |
| Clergymen (Not professionally trained) | Piano Teachers |
| Concern Managers | Radio, T. V. Announcers |
| Deputy Sheriffs | Reporters, Court |
| Dispatchers, R.R. Train | Reporters, Newspaper |
| I.B.M. Programmers | Surveyors |
| Interior Decorators | Title Searchers |
| Interpreters, Court | Tool Designers |
| Laboratory Assistants | Travel Agents |
| Landscape Planners | Yard Masters, R.R. |

d. **Farmers**

Farm Owners ($25,000-$35,000)
4. Clerical and Sales Workers, Technicians, and Owners of Little Businesses (Value under $6,000).

a. Clerical and Sales Workers

Bank Clerks and Tellers
Bill Collectors
Bookkeepers
Business Machine Operators, Offices
Claims Examiners
Clerical or Stenographic Conductors, R.R.
Employment Interviewers

Factory Storekeeper
Factory Supervisor
Post Office Clerks
Route Managers (Salesmen)
Sales Clerks
Shipping Clerks
Supervisors, Utilities, Factories
Toll Station Supervisors
Warehouse Clerks

b. Technicians

Camp Counselors
Dental Technicians
Draftsmen
Driving Teachers
Exeditor, Factory
Experimental Tester
Instructors, Telephone Co., Factory
Inspectors, Weights, Sanitary Inspectors, R.R., Factory
Investigators
Laboratory Technicians

Locomotive Engineers
Operators, P. B. X.
Proofreaders
Safety Supervisors
Supervisors of Maintenance
Technical Assistants
Telephone Co. Supervisors
Timekeepers
Tower Operators, R.R.
Truck Dispatchers
Window Trimmers (Store)

c. Owners of Little Businesses

Flower Shop ($3,000-$6,000)
Newsstand ($3,000-$6,000)

Tailor Shop ($3,000-$6,000)

d. Farmers

Owners ($10,000-$20,000)

5. Skilled Manual Employees.

Adjusters, Typewriter
Auto Body Repairers
Bakers
Barbers
Blacksmiths
Bookbinders
Boilermakers
Brakemen, R.R.
Brewers
Bulldozer Operators
Butchers

Cabinet Makers
Carpenters
Casters (Founders)
Cement Finishers
Cheese Makers
Chefs
Compositors
Diemakers
Diesel Engine Repair & Maintenance (Trained)
Diesel Shovel Operators
5. Skilled Manual Employees (Continued)

Electricians
Electrotypists
Engravers
Exterminators
Fitters, Gas, Steam
Firemen, City
Firemen, R.R.
Foremen, Construction, Dairy
Gardeners, Landscape (Trained)
Glassblowers
Glaziers
Gunsmiths
Gauge Makers
Hair Stylists
Heat Treaters
Horticulturists
Lineman, Utility
Linoleum Layers (Trained)
Linotype Operators
Lithographers
Locksmiths
Loom Fixers
Lumberjacks
Machinists (Trained)
Maintenance Foremen
Installers, Electrical Appliances
Masons
Masseurs
Mechanics (Trained)
Millwrights
Moulders (Trained)

Small Farmers

Owners (under $10,000) Tenants who own farm equipment

6. Machine Operators and Semi-Skilled Employees

Aides, Hospital
Apprentices, Electricians,
  Printers, Steamfitters,
  Toolmakers
Assembly Line Workers
Bartenders
Bingo Tenders
Building Superintendents (Cust.)
Bus Drivers
Checkers
Clay Cutters
Coin Machine Fillers
Cooks, Short Order

Delivery Men
Dressmakers, Machine
Drill Press Operators
Duplicator Machine Operators
Elevator Operators
Enlisted Men, Military Services
Filers, Benders, Buffers
Foundry Workers
Garage and Gas Station Assistants
Greenhouse Workers
Guards, Doorkeepers, Watchmen
Hairdressers
Housekeepers
6. **Machine Operators and Semi-Skilled Employees** (Continued)

<table>
<thead>
<tr>
<th>Meats Cutters and Packers</th>
<th>Steelworkers (Not Skilled)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter Readers</td>
<td>Strappers, Wire Machines</td>
</tr>
<tr>
<td>Operators, Factory Machines</td>
<td>Strippers, Rubber Factory</td>
</tr>
<tr>
<td>Oiler, R.R.</td>
<td>Taxi Drivers</td>
</tr>
<tr>
<td>Paper Rolling Machine Operators</td>
<td>Testers</td>
</tr>
<tr>
<td>Photostat Machine Operators</td>
<td>Timers</td>
</tr>
<tr>
<td>Practical Nurses</td>
<td>Tire Moulders</td>
</tr>
<tr>
<td>Pressers, Clothing</td>
<td>Trainmen, R.R.</td>
</tr>
<tr>
<td>Pump Operators</td>
<td>Truck Drivers, General</td>
</tr>
<tr>
<td>Receivers and Checkers</td>
<td>Waiters-Waitresses (&quot;Better Places&quot;)</td>
</tr>
<tr>
<td>Roofers</td>
<td>Weighers</td>
</tr>
<tr>
<td>Set-up Men, Factories</td>
<td>Welders, Spot</td>
</tr>
<tr>
<td>Shapers</td>
<td>Winders, Machine</td>
</tr>
<tr>
<td>Signalmen, R.R.</td>
<td>Wiredrawers, Machine</td>
</tr>
<tr>
<td>Solderers, Factory</td>
<td>Wine Bottlers</td>
</tr>
<tr>
<td>Sprayers, Paint</td>
<td>Wood Workers, Machine</td>
</tr>
<tr>
<td></td>
<td>Wrappers, Stores and Factories</td>
</tr>
</tbody>
</table>

**Farmers**

Small Tenants who own little equipment.

7. **Unskilled Employees**

<table>
<thead>
<tr>
<th>Amusement Park Workers (Bowling Alleys, Pool Rooms)</th>
<th>Messengers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ash Removers</td>
<td>Platform Men, R.R.</td>
</tr>
<tr>
<td>Attendants, Parking Lots</td>
<td>Peddlers</td>
</tr>
<tr>
<td>Cafeteria Workers</td>
<td>Porters</td>
</tr>
<tr>
<td>Car Cleaners, R.R.</td>
<td>Roofer's Helpers</td>
</tr>
<tr>
<td>Car Helpers, R. R.</td>
<td>Shirt Foldes</td>
</tr>
<tr>
<td>Carriers, Coal</td>
<td>Shoe Shiners</td>
</tr>
<tr>
<td>Countermen</td>
<td>Sorters, Rag and Salvage</td>
</tr>
<tr>
<td>Dairy Workers</td>
<td>Stagehands</td>
</tr>
<tr>
<td>Deck Hands</td>
<td>Stevedores</td>
</tr>
<tr>
<td>Domestics</td>
<td>Stock Handlers</td>
</tr>
<tr>
<td>Farm Helpers</td>
<td>Street Cleaners</td>
</tr>
<tr>
<td>Fishermen (Clam Diggers)</td>
<td>Truckmen, R.R.</td>
</tr>
<tr>
<td>Freight Handlers</td>
<td>Unskilled Factory Workers</td>
</tr>
<tr>
<td>Garbage Collectors</td>
<td>Waitresses (&quot;Hash. Houses&quot;)</td>
</tr>
<tr>
<td>Grave Diggers</td>
<td>Washers, Cars</td>
</tr>
<tr>
<td>Hod Carriers</td>
<td>Window Cleaners</td>
</tr>
<tr>
<td>Hog Killers</td>
<td>Woodchoppers</td>
</tr>
<tr>
<td>Hospital Workers, Unspecified</td>
<td>Relief, Public, Private</td>
</tr>
<tr>
<td>Hostlers, R.R.</td>
<td>Unemployed (No Occupation)</td>
</tr>
<tr>
<td>Janitors, Sweepers</td>
<td></td>
</tr>
<tr>
<td>Laborers, Construction</td>
<td></td>
</tr>
<tr>
<td>Laborers, Unspecified</td>
<td></td>
</tr>
<tr>
<td>Laundry Workers</td>
<td></td>
</tr>
</tbody>
</table>
Farmers

Share Croppers

This scale is premised upon the assumption that occupations have different values attached to them by the members of our society. The hierarchy ranges from the low evaluation of unskilled physical labor toward the more prestigious use of skill, through the creative talents of ideas, and the manipulation of men. The ranking of occupational functions implies that some men exercise control over the occupational pursuits of other men. Normally, a person who possesses highly trained skills has control over several other people. This is exemplified in a highly developed form by an executive in a large business enterprise who may be responsible for decisions affecting thousands of employees.

B. The Educational Scale.

The educational scale is premised upon the assumption that men and women who possess similar educations will tend to have similar tastes and similar attitudes, and they will also tend to exhibit similar behavior patterns. The educational scale is divided into seven positions:

(1) Graduate Professional Training. (Persons who complete a recognized professional course leading to a graduate degree are given scores of 1). (2) Standard College or University Graduation. (All individuals who complete a four-year college or university course leading to a recognized college degree
are assigned the same scores. No differentiation is made between state universities, or private colleges.) (3) Partial College Training. (Individuals who complete at least one year but not a full college course are assigned this position. Most individuals in this category complete from one to three years of college.) (4) High School Graduates. (All secondary school graduates whether from a private preparatory school, a public high school, a trade school, or a parochial high school, are assigned the same scale value.) (5) Partial High School. (Individuals who complete the tenth or the eleventh grades, but do not complete high school are given this score.) (6) Junior High School. (Individuals who complete the seventh grade through the ninth grade are given this position.) (7) Less Than Seven Years of School. (Individuals who do not complete the seventh grade are given the same scores irrespective of the amount of education they receive.)

III. Integration of Two Factors.

The factors of Occupation and Education are combined by weighing the individual scores obtained from the scale positions. The weights for each factor were determined by multiple correlation techniques. The weight for each factor is:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Factor Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupation</td>
<td>7</td>
</tr>
<tr>
<td>Education</td>
<td>4</td>
</tr>
</tbody>
</table>

To calculate the Index of Social Position score for an individual, the scale value for Occupation is multiplied by the factor weight for Occupation, and the scale value for Education
is multiplied by the factor weight for Education. For example, John Smith is the manager of a chain supermarket. He completed high school and one year of business college. His Index of Social Position score is computed as follows:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Scale Score</th>
<th>Factor Weight</th>
<th>Score X Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupation</td>
<td>3</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>Education</td>
<td>3</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Index of Social Position Score</td>
<td></td>
<td></td>
<td>33</td>
</tr>
</tbody>
</table>

IV. Index of Social Position Scores.

The Two Factor Index of Social Position Scores may be arranged on a continuum, or divided into groups of scores. The range of scores on a continuum is from a low of 11 to a high of 77. For some purposes a researcher may desire to work with a continuum of scores. For other purposes he may desire to break the continuum into a hierarchy of score groups.

I have found the most meaningful breaks for the purpose of predicting the social class position of an individual or of a nuclear family is as follows:

<table>
<thead>
<tr>
<th>Social Class</th>
<th>Range of Computed Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>11-17</td>
</tr>
<tr>
<td>II</td>
<td>18-27</td>
</tr>
<tr>
<td>III</td>
<td>28-43</td>
</tr>
<tr>
<td>IV</td>
<td>44-60</td>
</tr>
<tr>
<td>V</td>
<td>61-77</td>
</tr>
</tbody>
</table>

When the Two Factor Index of Social Position is relied upon to determine class status, differences in individual scores within a specified range are ignored, and the scores within the range are treated as a unit. This procedure assumes there are meaningful differences between the score groups. Individuals and nuclear families with scores that fall into a given segment of the range
of scores assigned to a particular class are presumed to belong to the class the Two Factor Index of Social Position score predicts for it.

The assumption of a meaningful correspondence between an estimated class position of individuals and their social behavior has been validated by the use of factor analysis by Hollingshead and Redlich (1958). The validation study demonstrated the existence of classes when mass communication data are used as criteria of social behavior.
Aakster, C. Psychosocial stress and health disturbances. Social Science and Medicine, 8, 77-90, 1974.


Journal of Human Stress, 1, 2, 1975.


Stotland, E. and Blumenthal, A. The reduction of anxiety as a result of the expectation of making a choice. Canadian Journal of Psychology, 18, 139-145, 1964.


LIST OF REFERENCES

