

RELATIONSHIP BETWEEN PATTERNS OF BEHAVIOR AND
LEVELS OF ANXIETY IN EXECUTIVES

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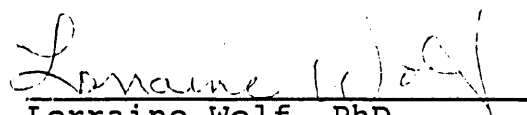
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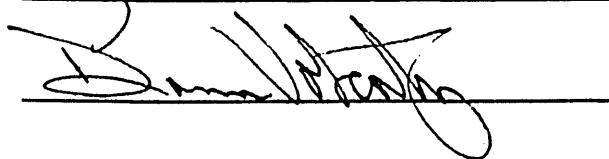
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To the Provost of the Graduate School:

I am submitting herewith a thesis written by Sue M. Tanner entitled "Relationship Between Patterns of Behavior and Levels of Anxiety in Executives." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Nursing.


Lorraine Wolf, PhD
Major Professor

We have read this thesis and
recommend its acceptance:

Accepted


Provost of the Graduate School

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ABSTRACT

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This nonexperimental descriptive study was done to determine if there was a relationship between level of anxiety and pattern of behavior prior to a diagnosis of a stress-related illness in executives. The sample included 30 executives from three different companies. Tools utilized included the State-Trait Anxiety Inventory to assess level of anxiety, the Bortner Rating Scale to assess pattern of behavior, and a demographic data sheet. Statistical analysis was achieved by calculation of a chi-square, Mann-Whitney U, and Wilcoxin Rank Sum W test. Results of the data analysis indicated no relationship existed between level of anxiety and pattern of behavior in this group of executives.

TABLE OF CONTENTS

ACKNOWLEDGMENTS	iii
ABSTRACT	iv
LIST OF TABLES	vii
CHAPTER	
1. INTRODUCTION	1
Problem of Study	4
Justification of the Problem	4
Theoretical Framework	7
Assumptions	12
Research Question	13
Definition of Terms	13
Limitations	15
Summary	15
2. REVIEW OF LITERATURE	16
Stress and Health	17
Occupational Stress	34
Personality Characteristics	43
Executive Stress	82
Behavior Modification	107
Summary	118
3. PROCEDURE FOR COLLECTION AND TREATMENT OF DATA .	120
Setting	120
Population and Sample	121
Protection of Human Subjects	121
Instruments	123
Data Collection	127
Treatment of Data	128
4. ANALYSIS OF DATA	129
Description of Sample	130
Findings	133
Summary of Findings	136

CHAPTER

5. SUMMARY OF THE STUDY	137
Summary	137
Discussion of Findings	138
Conclusions and Implications	140
Recommendations for Further Study	141
REFERENCES	143
APPENDIX	
A. AGENCY APPROVALS	165
B. QUESTIONNAIRE PACKET	169
C. AUTHOR'S PERMISSION	174

LIST OF TABLES

Table

1. Frequency and Percentage Distribution of Race,
Age, and Marital Status of Executives by
Type A and Type B Groups and Total Sample . . 132
2. Frequency and Percentage Distribution of
Education, Years of Employment as an
Executive, and House Worked per Week as
an Executive by Type A and Type B Groups
and Total Sample 134
3. Frequency and Percentage Distribution for
Scores on the STAI--Form X-1 by Type A
and Type B Groups and Total Sample 135

CHAPTER 1

INTRODUCTION

Cardiovascular disease accounts for 53% of all deaths in the United States. Every year over 1 million people develop heart disease and 650,000 die of it (Heart Facts, 1983). In 1976, the American Heart Association estimated the cost of stress-related cardiovascular disease to be \$26 billion per year. The mental and physical effects of job stress have been studied in the United States and estimated costs of loss of production, treatment, prevention, and damage done are between \$6 and \$20 billion per year, or 1% to 3% of the gross national product (Marshall & Cooper, 1979; McMurray, 1973). It has been suggested that stress costs substantially more than industrial accidents or strikes (Cooper, 1980).

Stress has been associated with both acute and chronic illnesses, such as headaches (Marcussen & Wolff, 1949), asthma (Wolf & Goodell, 1968), duodenal ulcers (Weiss, 1970), heart disease (Rosenman & Friedman, 1974), hypertension (Wolf & Goodell, 1968), and cardiac dysrhythmias (Natelson & Cagin, 1979). Job stress is one of the most universal and intense types of stress which can affect nearly everyone. Additionally job related emotional tension

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has been found to be more significant in the etiology of cardiovascular disease than heredity, ingestion of fats or other factors, and the level of responsibility seems to be more of a factor than the actual occupation (Russek & Zohman, 1958). Stress levels rise in periods of economic instability or recession. During an economic recession, medical statistics from the Department of Health, Education and Welfare's Epidemiology Center in Atlanta indicated an increase in peptic ulcers, heart disease, and other psychosomatic disorders (Pelletier, 1977).

Clearly, learned attitudes influence the way people adapt to stress, determine situations they find stressful, and determine the degree to which they react. In a group of men whose behavior was characterized by ambition, competitive drive, and preoccupation with deadlines, cardiovascular disease was found to be seven times more prevalent than in a group whose members were more relaxed in their daily living habits (Rosenman & Friedman, 1974). Thus, specific behavior patterns have been linked to responses to life situations, and these behavior patterns have been categorized as Type A and Type B behavior (Rosenman & Friedman, 1974).

A positive association has been found between occupational status and Type A pattern of behavior (Kiev, 1974; Reeder, 1959; Rummel & Rader, 1978). Executives, who

are subject to more anxieties than any other group, are often described as having classic Type A pattern of behavior (Kiev, 1974). Type A pattern of behavior encompasses 50% of the population, while Type B pattern of behavior comprises 40% and Type A-B comprises 10% of the population (Rosenman & Friedman, 1974). Type A pattern of behavior, characterized by a hard-driving, aggressive, competitive rushed lifestyle with a hostility component, has been cited in many studies as a significant causal factor in cardiovascular disease (Blumenthal et al., 1980; Breslin et al., 1979; Glass, 1977; Jenkins & Zyzanski, 1980; Nowack & Sassenrath, 1980; Rosenman & Friedman, 1974; VanDijl & Nagelkerke, 1980). Type A individuals work to their capabilities and expect others to do so. However, when Type A individuals are working in an organizational environment that is not supportive, they may have conflicting goals which can create excessive pressures and a physically vulnerable state (Cooper, 1980). Although the literature documents that executives are at risk, no research supports this. Most studies have been done on individuals of all occupations who already have a diagnosis of a stress-related disease. There has been little documented on top level managers prior to stress related disease, although the literature states they are at risk (Cooper, 1979, 1980; Marshall & Cooper, 1979).

Problem of Study

Managers have been found to suffer from physiological symptoms from stress at work, such as disabling heart attacks, which force them to retire prematurely. The mental and physical effects of job stress are disruptive influences on the manager as well as a cost to the organization on whom many individuals depend (Cooper, 1979). Therefore, the problem of this study was: Is there a relationship between patterns of behavior and levels of anxiety in executives who have not had prior diagnoses of stress-related illnesses?

Justification of the Problem

According to Holmes and Rahe (1967), "stress induced disorders are the major medical problem of post industrial nations" (p. 21). These stress disorders have been observed more frequently in countries where specific models of behavior and attitudes are prevalent. Models of behavior admired in our society which contribute to a high level of stress consist of emphasis on ambition, drive, goal orientation, financial success, and the appearance of being constantly busy (Pelletier, 1977).

In a study done by Keith, Lown, and Stare (1964) to describe coronary heart disease and behavior patterns, 189 men ranging in age from 35 to 55 years were selected. Three groups were examined which consisted of: individuals with

clinical coronary heart disease, individuals with peptic ulcer disease, and individuals possessing neither of the two diseases. Judgment of behavior type was made without prior knowledge of medical diagnosis. In this study, higher educational level was found to be associated with Type A pattern of behavior.

Health patterns associated with Type A pattern of behavior involving a managerial population were examined by Howard, Cunningham, and Rechnitzer (1976). These authors studied 300 top level managers of 12 major companies in Canada. Of the managers, 60% were found to possess Type A pattern of behavior, while 12% were found to possess Type B pattern of behavior. Of the 60%, 27% were classified as extreme Type A individuals. These authors concluded that Type A pattern of behavior declined with age. The highest percentage of individuals possessing Type A pattern of behavior were in the 35 to 55 year age group.

Dimsdale, Hacket, Brock, and Hutter (1978) found Type A pattern of behavior to be positively related to accumulation of stressful life events and current tension. Their research included 99 males and 10 females with an average age of 49 years. All individuals in this study had a diagnosis of coronary heart disease. However, occupational data were unavailable.

An experimental two-group design study was done by Suinn and Bloom (1978) to determine if an anxiety management program would reduce or change the hard driving component of Type A pattern of behavior. The sample consisted of 14 individuals who were selected through advertisements in a local newspaper. These individuals included volunteers between 24 and 55 years who were employed in managerial-professional positions and considered themselves to fit into Type A pattern of behavior characteristics. All but two of these individuals were male. Seven of the individuals were used as controls and the remaining seven were given a 3-week anxiety management program. The two groups were matched on the basis of the State-Trait Anxiety Inventory (STAI) Trait anxiety means. According to the authors, there was significant reduction in the hard driving component in the treatment group.

As more research (Roskies et al., 1979; Van Dooran, 1980) indicates a connection between personality and illness, the value of a holistic, preventive approach to health care becomes apparent. According to Pelletier (1977), if personality traits and certain modes of responding to life's events can be clearly defined and shown to be destructive to health, it may be possible to modify or avoid this behavior before it leads to physiological

symptoms. Thus, nurses in the workplace may be in a position to assess and educate employees in the techniques of identifying and altering personality traits and modes of responses to life events.

Theoretical Framework

The theoretical framework used for this study was based on May's (1977) theory of anxiety and Lazarus' (1977) theory of stress and coping. May defined anxiety as "the apprehension cued off by a threat to some value which the individual holds essential to his existence as a personality" (p. 191). May stated the core of the person is threatened when the person becomes anxious. By threatening the core, anxiety strikes at the very basis of the psychological structure. The threat is described as being to some strongly held value or symbol, such as patriotism, social success, financial security, family or social structure, or religious or political structure. The value is basic enough to be essential to one's security as a person. The anxiety is focused on that security, and, depending on the strength of selfhood or sense of being, the person may react either constructively or unconstructively. Anxiety is an integrating constructive response of the strong self which is impossible to avoid.

May (1977) differentiated between normal and neurotic anxiety. He described normal anxiety as a reaction proportionate to the threat and not involving repression or intrapsychic conflicts, while neurotic anxiety is a reaction which is disproportionate to the threat and does involve repression or intrapsychic conflicts. In most cases, he postulated, neurotic and normal anxiety are intermingled. Additionally, he noted that there is a strong circular relationship between neurotic anxiety and inner conflict and hostility.

According to May (1977), persons' anxieties are determined by the cultures in which they live and the development of those cultures. He indicated the values and goals held by individuals to be essential for their existence as individual personalities. He also believed these values and goals are largely cultural products. These goals include social prestige, goal of individual competitive success, and its related value of strong individuality. He proposed that the problem of anxiety and culture is independent with the quality and types of anxiety. With a stable culture, individuals have time to orient themselves, step back from anxiety-producing situations, and regain perspective in their sense of being. If the individuals' cultural milieus are in a state of

change and disunity, as in the present era when firm values are being questioned and doubted, individuals have no recourse to society or to an authority in a moment of fundamental decision making. Individuals must try to find within themselves a center of courage and strength in place of the basic social patterns on which they depended for their security and criteria. In many cases, due to over-emphasis and overreliance on participation in collectivism, persons turn within themselves only to find they do not have a center of strength within themselves.

Lazarus (1966) defined stress as "an internal state of the individual when he is faced with threats to his physical or psychic well-being" (p. 167). Lazarus (1977) noted that emotions cannot be understood without understanding the cognitive factors underlying the emotional reaction. Lazarus contended that cognitive processes determine the quality and intensity of an emotional reaction. He postulated that such processes also underlie coping activities, which continually shape the emotional reaction by altering the ongoing relationship between persons and their environments in various ways. Lazarus noted that emotions reflect how persons adapt to their environment and the way these patterns of adaptation can be judged as either damaging, threatening, challenging, or conducive to positive well-being.

Lazarus (1977) defined cognitive appraisal as "the cornerstone of the analysis of emotions" (p. 145), and this appraisal, from which the various emotions flow, is determined by the combination of personality and environmental stimuli. Emotion was defined by Lazarus (1977) as "a complex disturbance involving three main components: subjective affect (which includes the cognitive appraisal); physiological changes related to species-specific forms of mobilization for action; and actions having both instrumental and expressive features" (p. 146). Lazarus noted that somatic disturbances arise from an impulse to action, which in part defines the particular emotion and reflects the mobilization for action. The quality or intensity of emotion and its action impulse depend on a cognitive appraisal of the present or anticipated significance of the adaptive event for the person's well-being. In man, symbolic thought processes and learning play a predominant role.

Lazarus (1977) postulated that emotion changes over time as the stimulus presented and pattern of adaptation change. Emotions involve complex combinations of affect, and each comes from multiple cognitive appraisal elements to be found in any human transaction with the environment. These shifts in intensity and quality over time reflect

perceived and evaluated or appraised alterations in persons' relationships with the environment based in part on feedback from the situations and from their own reactions. How individuals are able to deal with the environment and the threat are factors in determining whether they will feel threatened or challenged by what happens. In regulating their emotional life, people are also regulating their bodily reactions which are a part of their emotional state.

Lazarus (1977) wrote that humans are capable of inhibiting emotional behaviors such as avoidance and regression or the behavioral expression of emotions such as grief, love, depression, and joy. Intrapsychic forms of coping such as detachment and denial are also capable of modifying, eliminating, or changing the emotion itself, including its subjective affect and the bodily states which are a normal feature of the emotion. If successful, these mechanisms modify the outward signs of emotions and dampen or eliminate the entire emotional syndrome.

Lazarus (1977) stated that much of the coping activity is anticipatory; persons anticipate a threat and this leads them to prepare against the future possibility of harm. To the extent that individuals prepare, they change the nature of the ultimate transaction, along with the emotions that might have been experienced in the absence of such

anticipatory coping. This analysis suggests that coping can precede emotion and influence its form of intensity.

Both May (1977) and Lazarus (1966, 1977) postulated that the environment and adaptation play a large role in coping with any stresses or anxieties with which individuals may be confronted. The way in which persons are able to deal with their environments and the threats are factors which determine whether persons will feel threatened or challenged by the stimuli presented. Both Lazarus and May stated that persons can cope with these threats if adaptation to a stable environment has been achieved. If living in stable environments or cultures, persons will be able to anticipate the threats presented and deal with them in adaptive manners. Thus, both May's theory of anxiety and Lazarus' theory of stress and coping provided the theoretical framework for this study of the relationship between patterns of behavior and levels of anxiety in executives.

Assumptions

For the purposes of this study and based on the theoretical framework, the following were assumed:

1. Anxiety is measurable (Lazarus, 1977; May, 1977; Spielberger, Gorsuch, & Lushene, 1970).
2. Behavior patterns of people are influenced by their environment and can be categorized and measured

(Bortner, 1969; Lazarus, 1977; May, 1977; Rosenman & Friedman, 1974).

Research Question

The research question in this study was:

Do executives without prior diagnoses of stress-related illnesses but with Type A pattern of behavior exhibit a higher level of anxiety than do executives without prior diagnoses of stress-related illnesses but with Type B pattern of behavior?

Definition of Terms

For the purposes of this study, the following terms were defined:

1. Anxiety level--a state of tension signaling potential impending danger; the warning of danger from the pressure of unacceptable internal attitudes that erupt into consciousness or action (Kolb, 1968). State level of anxiety is a transitory emotional state or condition characterized by feelings of tension and apprehension as well as heightened autonomic nervous system activity (Spielberger et al., 1970). In this study, state level of anxiety was measured by the State-Trait Anxiety Inventory (STAI), Form X-1 (Spielberger et al., 1970).

2. Executives--any persons paid for full-time jobs in which they directly help to set company objectives and policies, are required to make or approve decisions affecting profits and future plans, maintain and develop an organization of trained subordinates to achieve company objectives, delegate responsibility and authority to the organization, and control performance and results through at least one level of supervision (Jennings, 1965), as determined by the personnel departments in the selected corporate settings.
3. Prior diagnoses of stress related illnesses--medical treatment or intervention of conditions such as the following: lung disorders, stomach ulcers, high blood pressure, heart diseases, chronic headaches, neurological disorders, psychiatric disorders, stomach disorders, and substance abuse.
4. Type A pattern of behavior--an action, emotion-complex that can be observed in any person who is aggressively involved in an incessant struggle to achieve more and more in less and less time, and if required to do so, against the opposing efforts of other things or persons (Rosenman & Friedman, 1974). In this study, patterns of behavior were measured by the Bortner (1969) scale.

Subjects with scores of 196.5 or higher were classified as having Type A behavior pattern.

5. Type B pattern of behavior--rarely harried by desires to obtain a wildly increasing number of things or participate in an endlessly growing series of events in an ever increasing amount of time (Rosenman & Friedman, 1974). In this study, patterns of behavior were measured by the Bortner (1969) scale. Subjects with scores of 196.4 or below were classified as having Type B behavior pattern.

Limitations

Since this study included a sample of convenience, no cause and effect relationships were established and findings cannot be generalized outside the study corporations.

Summary

Researchers have suggested that executives are under constant job pressures due to the advanced technological state of society. Stress disorders have been shown to be associated with acute and chronic illnesses as well as the major medical problems faced today. Although literature documents that executives are at risk, no research was found on executives prior to diagnosis of a stress-related illness. Therefore, the relationship between patterns of behavior and levels of anxiety in executives without prior diagnoses of stress-related illnesses was investigated.

CHAPTER 2

REVIEW OF THE LITERATURE

Stress is a phenomenon which has been researched for more than 30 years. Although theories of stress are numerous, confusion still exists regarding the real meaning of stress. Most theorists attempt to explain an organism's physiological response to stress (Burchfield, 1979). Additionally, most current medical textbooks attribute 50% to 70% of all illnesses to stress-related disorders. According to Matteson and Ivancevich (1982), these diseases of adaptation are brought about in a large part by lifestyle and in many cases may be postponed indefinitely by giving proper attention to prevention. Therefore, this study was designed to investigate the relationship between patterns of behavior and levels of anxiety in executives.

The literature was reviewed and five major topics emerged. These topics included literature related to stress and health, occupational stress, personality characteristics, stressors related to the role of executive, and behavior modification.

Stress and Health

Stress has been accepted as being anything that causes an alteration in the homeostatic process (Selye, 1946). Homeostasis refers to the maintenance of equilibrium or balance within the internal bodily system. As long as the environment remains constant, little or no effort is required by the body to maintain equilibrium. When the environment changes, internal regulators must adjust to maintain homeostasis, which may involve many of the body's systems.

All individuals possess the ability to maintain homeostasis (Matteson & Ivancevich, 1982). This ability includes maintenance of psychological homeostasis as well as physiological homeostasis. All emotions are alterations in the psychological homeostatic state. Emotions come into play as an adaptation measure to maintain psychological homeostasis (Burchfield, 1979). A stressor is the stimulus which causes the stress response to come into play. Stressors are the consequence of the stress reaction, and stressors have been recognized as being adverse to health and well-being (Burchfield, 1979; Matteson & Ivancevich, 1982).

According to many authors (Burchfield, 1979; Engel & Schmale, 1972; Meichenbaum, Turk, & Burstein, 1975; Selye, 1976), in order for a person to react to a stressor, the

individual must first perceive the event as being stressful. Two types of stress which have been identified are acute and chronic stress. Acute stress can be defined as any event occurring within a short time period which does not recur frequently, if at all, while chronic stress involves a stimulus or stressor to which the individual is constantly exposed. To attain a high level of wellness, an individual under either acute or chronic stress must achieve three goals which include: maintenance of homeostasis, conservation of resources, and effective defenses against stress (Burchfield, 1979). Although these three goals may be easy to attain in acute stress, as pointed out by Engel and Schmale, in chronic stress achieving these goals would result in depletion of resources and homeostatic alterations. Selye (1976) indicated failure to adapt to chronic stress suggests the maladaptation results of psychological and not physiological exhaustion. He noted this maladaptation, due to the use of ineffective coping mechanisms, increases the individual's susceptibility to illness. Therefore, according to Meichenbaum et al., individuals who have difficulty in dealing with stress should be taught to identify maladaptive as well as adaptive coping mechanisms.

Stress and its relationship to health has been studied by many researchers over many years. Social stimulation was found by Wolff and Goodell (1968) to be linked with disease in a longitudinal study that extended over 30 years. The authors reported a series of experiments which utilized stress-induced interviews to precipitate such conditions as migraine headaches, asthmatic bronchitis, hypertension, urticarial reactions, and hypersecretion of gastric acid. The sample consisted of both male and female patients at New York Hospital over the 30-year period. Data collection involved the use of questionnaires and interviews. The authors found that bodily reactions were correlated with emotions.

In another study, Holmes, Davies, and Hawkins (1957) demonstrated a relationship between psychophysiologic reactions induced by stressful life events and the natural history of disease. In their retrospective study, the authors used a life chart to study clusters of events at the onset of symptoms of tuberculosis. Examples of life events which the authors utilized included marriage, occupation, interpersonal relationships, and level of education. Holmes et al. used the interview technique as follow-up which demonstrated that various events elicited adaptive coping behaviors. The first sample consisted of 17 male and 3

female Anglo-Saxons, all employed at Firland Sanatorium and eligible for compensation because of a diagnosis of tuberculosis due to employment. A second sample was obtained; each was given a skin test in various strengths, an initial chest x-ray at the time of employment and subsequent chest x-rays at 3-month intervals. The two samples were matched individually by age, sex, marital status, education, time of employment, job classification, income, skin test reading, chest x-ray appearance and previous record of chronic conditions possibly related to tuberculosis. These diseases included diabetes, hyperthyroidism, asthma, pulmonary emphysema, mitral stenosis, pulmonary stenosis, silicosis, hypertension, and alcoholism.

Holmes et al. (1957) measured previous occurrence of psychosocial stress by means of a schedule of recent experience which was developed by the sanatorium and cross-validated on two samples totaling 165 admissions. Maximal validity was established by falling in the age range of 25-65 years. A reliability coefficient of 0.831 was obtained between the first and second administration of the form within 5-month intervals in a group of 40 newly admitted Anglo-Saxon patients with tuberculosis between the ages of 25-60 years. Level of personal integration was measured by

the Cornell Medical Index, a standardized list of 195 items used for screening psychoneurotic suspects, and its reliability was 0.805 when tested in the same manner as the schedule of recent experience. A t-test was performed and found to be 3.32, which was significant at the .005 level. A chi-square was calculated and found to be significant at the .05 level. Holmes et al. concluded that many of the employees who became ill did so in a situation of stress which would be conducive to decreased resistance.

Following 10 years of study, Holmes and Rahe (1967) developed a total life change tool, and these researchers established that when the total life change score was increased, the probability of disease also increased. Holmes and Rahe demonstrated that even positive events such as marriage and promotion can increase susceptibility to disease because they frequently challenge the individual's coping mechanisms. The sample included 394 individuals, 179 males and 215 females, who were selected by convenience sampling technique. Of this sample, 171 were single and 223 were married. Each respondent completed a paper and pencil test that included 43 life events which had been derived from clinical experience. Validity and reliability of the tool, measured by the test-retest correlation, was .90. Two categories of life events were established: those

indicative of the lifestyle of the individual and those indicative of occurrences involving the individual. Interviewing techniques were used to assess the meanings the life events held for the individuals. Holmes and Rahe concluded that the occurrence of each life event was associated with some adaptive or coping behavior on the part of the involved individual.

In a follow-up study, Rahe, Romo, Bennett, and Siltanen (1974) demonstrated a significant increase of life changes 6 months prior to a myocardial infarction (MI) as compared to the same interval a year earlier. The sample included 279 survivors of a myocardial infarction and 226 victims of abrupt coronary death in Helsinki. Interviewing techniques were used with the spouses of the victims. Data were collected from April through August of the same year on 243 consecutive survivors (all less than 65 years of age) of acute myocardial infarction. The spouses as well as the individuals suffering the myocardial infarction were interviewed by a nurse. An attempt was made to obtain data regarding recent life changes from April through October of the same year on all victims of abrupt coronary death from the victims' spouses or close relatives. In all but one group, significant life changes had occurred during the 6 months prior to the infarction or death.

Rahe et al. (1974) reported that both hypotheses in this longitudinal study were supported: (1) Subjects with illnesses reported during the 2 years prior to the study indicated higher life change units during those 2 years than did subjects with no illness during the time period. (2) Subjects' final 6 month life change unit totals were higher than their 6 month life change unit totals for the comparable time period 1 year earlier. A one-tailed t -test and a two-tailed t -test with intergroup comparisons were calculated. The Pearson product-moment correlaton was utilized in assessing patient-spouse agreements as to patients' recent life change data.

Rahe et al. (1974) reported that age varied from 30-65. The mean age of myocardial infarction survivors was 55; 74% ($n=279$) were married. The mean age of the sudden death group was 56 with 75% ($n=226$) of the group married. The mean age of the delayed group was 57 with 73% ($n=243$) married. Of the sample, 56% were between 30-65 and female. Of the 279 myocardial survivors, 22% was female; 18% of the group of 226 sudden deaths was female; and 31% of the group of 243 delayed deaths was female. No differences were found between occupational distribution of the three coronary heart disease groups. Matched comparisons of the coronary

heart disease groups with the Helsinki men indicated an overrepresentation of the coronary heart disease men toward skilled and unskilled occupations along with underrepresentation of the coronary heart disease men in professional and highly skilled occupations.

Medical history in Rahe et al.'s (1974) study revealed that 23% of the myocardial infarction group had experienced a previous myocardial infarction, 32% of the sudden death group had experienced a previous myocardial infarction, and 39% of the delayed death group had experienced a previous myocardial infarction. The myocardial infarction survivor group reported an increase of 69% (from 23-39) in their life change unit scores for 6 months prior to their MI ($p \leq .005$). The sudden death group reported an increase of 143% (from 21-51) in their life change units for 6 months prior to death ($p \leq .005$). In the delayed death group there was not a significant increase in their life change units (20%; 33-42). Pearson product-moment correlations were calculated between MI survivors and spouse pairs and were found to be +0.74 to +0.26, significant at $p \leq .05$. Rahe et al. concluded that findings supported the idea of a nonspecific stressor effect of the subjects' recent life changes increased in terms of the particular illness which followed.

In a study done by Hinkle (1974), health was adversely affected by changes in culture, social milieu, and interpersonal relationships. This nonexperimental prospective study included 1,300 telephone operators over a 20-year period. The author reported that results showed that healthy operators liked their work better, found it easier and more satisfying. Healthy operators also liked their friends and associates and were content and comfortable in their lives, while those with many illnesses found work confining, boring and were unhappy with their lives and in their families.

Psychosocial factors which involve the individuals' interactions with their environment as well as individuals' personality and behavior have been found to stimulate the neuroendocrine system, which in turn results in disturbance of a specific organ system. According to Cassel, Harris, and Singer (1968), this neuroendocrine process causes thickening of the blood vessels with progressive loss of nutrition to the tissues as well as disruption of the immune response which results in increased susceptibility to viruses, parasites, neoplasms and other autoimmune diseases. These psychosocial factors, as noted by the authors, have been identified as aggressive asocial behavior and the associated responses which replace normal nurturance and

social patterning. The particular disease, stated Henry and Stephens (1977), depends on the individuals' previous histories and susceptibilities.

According to Kiritz and Moos (1974), social stimuli do not act directly on an individual. These authors suggested it is the individuals' interpretations of the social environments mediated by personality variables, role, status relationships and their behavior within the environment which affects individuals and influences personality and behavior. Kiritz and Moos stated that even two individuals working in the same environment may respond differently as they have different social assets. The two may be likely to differ in their emotional responses to the same environment because their resources for defending the emotional arousal would differ greatly.

Many authorities (Cassel, 1974; Hinkle, 1973; Rahe, 1976) reported that people's responses to their life situations or social conditions depend on the meaning these situations have to the specific individuals. According to Rahe, a person's recent life change experiences pass through several stages of perceptions and defenses before symptoms are perceived.

Kahn and Levi (1974) utilized a sequential view of the psychosocial processes involved in the development of

chronic disease. These authors recognized the combination of psychosocial stimuli along with the psychobiologic program as determining the psychologic and physiologic reaction mechanisms or stress of each individual. These authors recognize this sequence as being promoted or counteracted by interacting variables.

In another study, Theorell and Rahe (1975) demonstrated that an increase in life changes was associated with coronary death. This was a nonexperimental, retrospective study which included 18 males and 18 females who died of myocardial infarctions. A control group was also utilized. This group included 18 males and 18 females who were matched with the first group as to age. The control group had suffered an MI 6 years earlier. Data were collected by reviewing outpatient records to prepare blind estimates of the individual's life change information. Information was collected and coded by a second investigator who was unaware of the group to which the individual was assigned. The 2-year period preceding MI was reviewed for evidence of life change unit increases. Physiological data collected included the presence or absence of cardiac arrhythmias over the entire 2-year period. According to the authors, results concluded that the group who had died of MI showed an increase in life change unit scores which peaked 7-12 months

prior to death. Variability in the 6-month life change unit scores for the expired group was statistically different ($F=4.38$, significant at $p \leq .05$). There was no significant difference seen for the control group. The authors reported that results suggested life stress as indicated by life change events may play a larger role in coronary death than suspected.

Culture has also been thought to play a part in a decreased stress response. Matsumoto (1970) stated that it was the absence of social stress which was responsible for Japan's lower rate of coronary heart disease (only 1/8 of that of the United States). Matsumoto concluded that in well-integrated societies, anxieties and tensions are kept within appropriate limits by the techniques used by certain social groups. The author described the difference between Western culture and Japanese culture in regards to behavior. He stated that in the West, people are regarded as individuals, whereas in Japan, their behavior reflects a greater expression of attachment and interdependence. Japanese culture encourages attachment behavior. From the occupational standpoint, once a Japanese company hires an employee, that employee is rarely dismissed. Seniority is a major criterion for advancement and changing jobs from one company to another is rare. The Japanese also socialize

with fellow workers which, according to Matsumoto, creates strong interpersonal relationships.

Marmot and Syme (1976) followed up on Matsumoto's (1970) theme. These authors contrasted behavioral patterns and incidence of coronary heart disease in Japanese-Americans who were acculturated to the competitive individualistic American way of life with Japanese-Americans who remained closely tied to a more traditional Japanese culture. The authors contended that absence of an effective social support system may be the cause of increased incidence of coronary heart disease in the United States. A dominant feature, as noted by Marmot and Syme, of the Japanese society is commitment of the individual to the group. Personal obligation and duty are seen as more important than individual fulfillment. The community is the locus of value, and Japanese goals are sought in cooperation with their peers. Thus, the Japanese social structure protects individuals against the challenges of the unfamiliar and against challenges of changing technology for which persons are unprepared. Therefore, according to the authors, advancement along socially prescribed lines in Japan as well as a lack of competition within the group differs from the Type A pattern of behavior of the highly individualized, striving, ambitious and competitiveness in the

United States. Marmot and Syme concluded that American culture may promote more coronary heart disease for these reasons. The authors further suggested that for any subgroup of Japanese culture, the greater their exposure to American culture, the greater their chance of acquiring coronary heart disease.

Rapid social change was another question. Cassel and Tyroller (1961) demonstrated that rural mountaineers working in factories showed an increased incidence of coronary heart disease. These authors compared the traditional society, which supports persons socially and culturally by presenting them with stable patterns of a familiar world, to a transitional society which confronts persons with challenging situations of discontinuity or incongruity due to rapid sociocultural changes. The sample included white male, hourly paid employees of a factory on the active company payroll for a 4-month period. There were 1,968 individuals from which a stratified random sample of 390 persons was drawn. The stratification was made on the basis of age, absence experience, and medical examination status (those diagnosed as having major or potentially serious medical abnormalities and those not examined). The sample was further divided into first generation (individuals in which neither parent had been employed in the industry) and

second generation (industrial workers in which at least one parent had been employed in the industry). Data were obtained on generation status, length of service, marital status, and two general indices of health status: absences of more than 3 days duration due to illness and number of positive responses given on the Cornell Medical Index Health Questionnaire. The age of the sample was 20 to 50 years, with more first generation workers than second generation workers. The authors hypothesized that first generation workers would have higher indices of ill health than second generation workers. Results, according to Cassell and Tyroller, indicated that first generation workers tended to have lower rates of illness than second generation workers in early years of service, but had higher rates with increasing length of service.

A second study utilizing the same sample was done by Tyroller and Cassell (1964). These authors postulated that the first generation factory workers would be more likely to experience cultural incongruities between the cultural attributes which they had been equipped with and the demands of the factory situation than would second generation factory workers. The authors predicted that even though these two groups were drawn from the same ethnic stock, were doing similar jobs in the same environment and

were alike in age, sex, and marital status, the first generation employees would exhibit a greater number of indicators of morbidity than would the second generation employees. The study was limited to deaths due to coronary heart disease occurring in white male residents of North Carolina who were between the ages of 55-64. The average annual death rates per 1,000 were computed for two 3-year periods (1951-1953 = 6,479 deaths; 1959-1961 = 8,231 deaths). Results, according to the authors, indicated that the proportion of deaths increased with increased urbanization (16% to 72%).

Another study was done to assess the prevalence of coronary heart disease in Japanese-Americans living in eight San Francisco Bay area counties (Marmot, 1975; Marmot & Syme, 1976; Marmot et al., 1975). The sample included 3,800 Japanese-Americans. Each individual completed medical, demographic, and cultural questionnaires from which four indices of acculturation were compiled to measure cultural upbringing, cultural assimilation, social assimilation, and social and cultural attitudes. Laboratory procedures and a 12-lead EKG were also utilized. When classified according to cultural upbringing, the most acculturated group of the Japanese-Americans was found to possess two to five times more coronary heart disease than the most traditional group.

Dietary habits, smoking, blood pressure, cholesterol and triglyceride levels, weight and glucose were controlled. When classified as to cultural up-bringing and to the degree to which they were dissociated from the ethnic group, there was a fivefold difference between the most and the least acculturated groups. The least acculturated group had a prevalence comparable to the low rates observed in Japan, and the most acculturated group approximated the high rates observed in the American-Caucasians. According to the researchers, these differences in disease rates were not explained by differences in coronary risk factors. The authors concluded that although the differences in dietary habits in Japan and the United States may be related to incidence of disease, these habits alone do not explain the differences in disease rates. The authors reported that evidence suggested that closely knit, stable groups whose members enjoyed support of their fellow man may be protected against otherwise highly socially stimulating situations in a rapidly changing society.

In summary, stress and its relationship to health has been studied for over a quarter of a century. Many researchers have documented the effects of stress on the health and well-being of individuals. Since most persons are gainfully employed a large percentage of their adult

life, it was of particular interest to review research dealing with the relationship between stress and occupation.

Occupational Stress

Researchers (Cooper, 1981; Cooper & Marshall, 1978; Kahn & Quinn, 1970; McQuade, 1972) have reported that over the past 20 years the incidence of stress-related illness has increased and there is evidence which suggests that occupational stress is a causal factor in stress-related diseases. Matteson and Ivancevich (1982) concurred that this increase is thought to be due in large part to the great amount of time spent in the work force and in career-related activities as well as the combination of responsibility accepted and put forth on the job.

Researchers, according to Cummings and Cooper (1979), have traditionally focused on the relationship between current conditions at work, such as work overload, role conflict, overpromotion, as well as individual coping behaviors, such as escapist drinking, smoking, and reduced aspiration. Although this does account for existing stresses at work, it ignores the possibility that factors not currently in the work environment, such as threats, may also affect the individual. For example, employees' present levels of advancement may not affect their behaviors adversely, but

realization that a promotion to a job for which they are unqualified may be quite stressful.

Possible sources of occupational stress have been identified throughout the literature as work overload, role ambiguity, role conflict, and assumption of responsibility for people (Cooper & Marshall, 1976; Matteson & Ivancevich, 1982). According to the authors, most occupational stress is believed to be precipitated by change. All change involves a loss of some kind. In the occupational environment, as noted by Levinson (1969, 1970), although promotions and transfers may be desired, they are still changes, and change remains a threat to the ways people have developed to handle their dependency needs as well. Also, throughout the literature, stress has been shown to result in impaired performance, increased rigidity of behavior, and reduced ability to problem solve. According to McLean (1972), under stressful conditions, perception is often disrupted and less adaptive than under normal circumstances.

Role conflict occurs when there is a conflict between the requirement of the role as the individual sees it and their own needs, goals, and objectives (Matteson & Ivancevich, 1982). Role ambiguity occurs when the job is not fully defined (Cooper & Hennig, 1979; Davidson & Cooper, 1981). Role conflict and role ambiguity have been studied

change. Four component scores were developed which reflected responses in terms of the amount of change wanted, number of activities involved, changes in time allocation wanted, and changes in behavioral style wanted. The researchers found that positions involving creative problem solving were more likely to be conflict ridden. Positions in supervision and management were more often in conflict than nonsupervisory positions. Responses of individuals to role conflict were mediated by the personality of the focal person and by the quality of his interpersonal relation. Under high conflict conditions, people who tended to be anxiety prone experienced more conflict and reacted to it with greater tension than those not anxiety prone. The authors reported that introverts reacted more negatively to role conflict, suffered more tension and reported more deteriorated interpersonal relations than extroverts.

In a follow-up study designed to describe the prevalence of role conflict and ambiguity in the work environment, Kahn et al. (1964) concluded that the experience of role conflict was common in the work environment. This nonexperimental survey consisted of an interview of 1,500 respondents from all levels of jobs from first line supervisor to corporate officer. Each was treated as a focal person and responded to the same basic

questions about his role as did the 53 respondents in the aforementioned study. According to the authors, results indicated that almost 50% of the respondents reported being caught in the middle between two conflicting persons or factions more or less frequently. Nine out of 10 individuals reported at least one of the parties to the conflict was above them in the organization. Less than 50% said the conflict was outside the organization. Of the respondents, 35% stated they were unclear about their responsibilities and were disturbed by that fact. Kahn et al. reported that 35% of the subjects stated feelings of unclarity and disturbance about what their co-workers expected of them, how their supervisors evaluated them, and what opportunities for advancement were for them. Ambiguity was correlated with job-related tension ($r = -.5$), job dissatisfaction ($r = -.3$), sense of futility ($r = -.4$), low self-confidence ($r = -.3$), and low trust and liking for co-workers ($r = -.4$).

Kraut (1965) undertook a study to replicate Kahn et al.'s (1964) study and to collect quantitative data (in terms of dollars of sales) to indicate the magnitude of disagreement and the effects of disagreement on worker performance. Kraut concluded that there was a general tendency to underestimate supervisors' expectations and thus for employees to perceive their supervisors as nearer their

own positions than was in fact the case. The sample in this nonexperimental survey consisted of 823 salesmen and their managers in 151 offices. The study was conducted in the sales department of a large corporation with a decentralized nationwide structure of sales offices. In each of the 151 offices, data were obtained from written questionnaires completed by both the sales managers and the salesmen. These questionnaires, as reported by the author, measured objective and subjective measures of role conflict. Subjective role conflict was found to be significantly less than objective conflict. Kraut postulated that this distortion was viewed as a way of coping with conflict and reducing its tension-evoking effects.

Work overload occurs when a person has too many things to do or an insufficient time in which to do them (Marshall & Cooper, 1982). Several researchers (Caplan, 1971; French & Caplan, 1973; French, Tupper, & Mueller, 1965; Sales, 1969) studied the subject of work overload.

A study which differentiated between qualitative and quantitative work load was performed by French et al. (1965). The sample included 122 university professors and administrators. Factor analysis indicated that qualitative and quantitative work load were separate and distinct variables which showed some similar effects. Both

qualitative and quantitative overload were related to job tension ($\underline{r}=-.6$ and $\underline{r}=-.4$, respectively), but their relationship to self-esteem was more specialized. Quantitative overload was related to low self-esteem among administrators, but not among professors. The authors reported that self-esteem of professors was related to qualitative overload ($\underline{r}=-.3$).

A subsequent study was done by Sales (1969) to examine the degree in which work overload correlates with job-related tensions and thus role conflict. In this study, an index of work overload was formulated from three items of the first intensive study. These items included the amount of pressure to do more work, the feeling of not being able to finish one's work in an ordinary day, and the feeling that the amount of work interfered with how well the job gets done. The sample included 53 individuals from major corporations representing the full range of jobs from the first level supervisor to corporate officer. The author concluded there was a .6 correlation between work overload and job-related tensions.

Researchers (Caplan, 1971; French & Caplan, 1973) at Goddard and Kennedy Space Centers concentrated on the process of overload and developed separate measures of qualitative and quantitative load. Data collection

consisted of observations and records of numbers of meetings, office visits, telephone calls, and hours worked. According to the French and Caplan, results concluded that 73% of the individuals interviewed at Goddard reported overload, while 44% male white collar workers in the nation as a whole reported overload. Among Goddard scientists, this overload was qualitatively associated with low self-esteem ($r = -.3$). At Kennedy, research was done to examine the strains associated with ambiguity. Criteria examined by Caplan included health and illness in response to work overload. The sample included 22 men at NASA who were observed at work for periods of 2-3 hours on three separate days. The researcher concluded that there was a correlation between reported overload and observed number of phone calls and visitors ($r = -.6$). Both subjective and objective overload were related to increased heart rate ($r = -.7$) and to increased cholesterol levels ($r = -.4$). According to Caplan, findings on ambiguity as related to job stress were replicated ($r = -.4$). Ambiguity was also found to be related to feelings of job related threat and mental and physical well-being ($r = -.5$) and to lack of utilization of intellectual skills and knowledge ($r = -.5$). Ambiguity was reported by 60% of the men in that organization.

Responsibility for people, especially when it involves their futures, is likely to produce strain (McLean, 1972). In the study done at NASA, Caplan (1971) concluded that smoking was significantly associated with increased responsibility for people and things as measured by two brief self-report measures. Diastolic blood pressure was also found to be positively associated with the amount of time the person says he spends in exercising responsibility for others' futures, but not with other aspects of responsibility.

In another study involving air traffic controllers who worked in control towers or centers, Cobb and Rose (1972) found that diabetes, high blood pressure, and myocardial infarction as well as peptic ulcers were common among persons subjected to heavy, close personal responsibility for lives of other people. The sample included 4,325 male journeyman air traffic controllers working in towers or centers in comparison to 8,435 male second class airmen. Both groups were applying for renewal of their licenses in 1969-1970. Both groups were also given physical examinations by the same group of physicians. The authors reported that high blood pressure was four times more prevalent among air traffic controllers than among second class airmen after an adjustment was made for age ($p \leq .025$).

The prevalence of mild diabetes controlled by diet was found to be 2.3 times as high for air traffic controllers than for second class airmen ($p \leq .05$). Peptic ulcers were found to be two times more prevalent among air traffic controllers than second class airmen ($p \leq .001$).

Personality Characteristics

There have been dramatic increases of stress related illnesses in the past three decades. Coronary heart disease is now responsible for one third of all deaths in industrial societies, although it was rare 60 years ago. This increase has paralleled the period of rapid industrialization in modern societies which suggests factors related to 20th Century lifestyles and employment may be relevant (Chesney & Rosenman, 1980).

Researchers have been attempting to identify predictors of coronary heart disease for many years. In one such investigation, Keys et al. (1971) conducted a nonexperimental prospective study which took place over 20 years with the purpose of attempting to identify characteristics which predispose men to develop coronary heart disease. The sample included 279 males, ages 47-57, free of coronary heart disease and classified as being in the high socioeconomic level and whose occupations included business and

professions. These men all lived in the suburbs of the twin cities of Minneapolis and St. Paul.

Data collection methods used by Keys et al. (1971) included baseline heart rate and blood pressure monitoring, 12-lead EKG, venous blood samples, urine tests, chest x-rays, detailed medical and physical examinations, and a standard medical questionnaire completed by each participant. The cold pressor test was also administered. This test consisted of immersing the hand in ice water for 60 seconds and blood pressure was recorded by the auscultatory method in the opposite arm before immersion, at 30 seconds, and in the last 10-15 seconds of immersion. Vital capacity was measured with a spirometer. Hemoglobin, serum protein iodide and cholesterol levels were measured. Relative body weight and skin-fold thickness was also measured. Yearly follow-up were attempted on all participants.

Keys et al. (1971) reported that among the 279 men who were free of coronary heart disease at the onset of the study, 60 men developed coronary heart disease within the 20-year period. The authors reported the most significant single variable for coronary heart disease prediction in this study proved to be a physiologic indicator, the rise of diastolic blood pressure in the cold pressor test. The

relative risk ratio for coronary heart disease or myocardial infarction of the hyper-reactor group was 2-4 times that of the men who showed a rise of more than 20 mm in diastolic pressure in the test. Of the 198 men with a rise of less than 20 mm in the cold pressor test, 22 died from coronary heart disease or suffered a myocardial infarction.

Additionally, the authors found a statistically significant ($p \leq .001$) higher incidence of coronary heart disease in men who were heavy smokers than among those who had never smoked. The authors also reported that none of the measurements of weight or body fold thickness showed a significant difference to coronary heart disease. Also, the researchers reported finding in this study no significant relationship between cholesterol level and incidence of coronary heart disease.

Patterns of behavior have been documented as a possible contributing factor to heart disease for more than 100 years. Documentation exists that excessive work load and other behavioral characteristics were typical of individuals who develop coronary heart disease. As early as 1868, Von Dusch noted these factors (Chesney & Rosenman, 1980; Cooper & Payne, 1980).

In the late 1950s, Friedman and Rosenman (1958) observed similar behavioral characteristics in their

patients, especially in the patients who were under 60 years of age, and the authors labeled this behavior Type A pattern of behavior. The authors described Type A pattern of behavior as one which is characterized by enhanced hostility, ambitiousness, competitiveness, preoccupation with deadlines as well as with work. Type A individuals are caught in a chronic struggle to reach an ever-expanding number of goals in a short period of time and/or against opposing environmental forces. According to Rosenman and Friedman, individuals with Type A pattern of behavior continuously experience impatience and a chronic sense of time urgency. Type B pattern of behavior was labeled to be the opposite of Type A pattern of behavior.

Over the past 30 years, Type A pattern of behavior has become an established risk factor for coronary heart disease. Modern society is work oriented, and therefore the Type A pattern of behavior, which is characterized by a hard driving, aggressive style of life in which devotion to work is often a central element, is rewarded and reinforced by cultural context (Chesney & Rosenman, 1980). Type A individuals describe themselves as eager and challenged, and they rise to meet competition and challenges of all types. They thrive on the pace they set for themselves and only wish there was more time to meet or accomplish their job

goals (Cohen, 1978). Characteristic behaviors have been found to emerge when the individual with Type A pattern of behavior becomes challenged.

Osler (1892) also described the individual prone to develop coronary heart disease as one who is "keen, ambitious, and possesses a sense of time urgency" (p. 26). Other researchers have documented a relationship between coronary heart disease and strong aggressive tendencies, hard driving and goal directed (Arlow, 1935; Dunbar, 1943; Gertler & White, 1954; Menninger & Menninger, 1936).

Rosenman and his associates (1975), in a prospective study, examined the relationship between Type A pattern of behavior and coronary heart disease. Data were obtained at the beginning of the study as well as annually; this study took place over 8.5 years. The sample included 3,154 males, aged 39-59, employed in 10 companies in California. Pattern of behavior was established by the use of structured interviews as well as voice and speech videotapes with emphasis on speech and motor characteristics. Despite the subjective nature of this type of assessment, interrater reliability was found to be $\underline{r} = .64$ to $\underline{r} = .84$. The standard \underline{t} -test was calculated on all variables and descriptive measures of rates and means were calculated. Of the subjects, 1,589 men were found to have Type A pattern of

behavior, while 1,565 men were found to have Type B pattern of behavior. Thus, the authors found that those individuals categorized with Type A pattern of behavior at the onset of the study had two times the rate of clinical coronary disease, were five times more likely to suffer a second myocardial infarction, and had twice the rate of fatal heart attacks than those with Type B pattern of behavior.

Several other variables were also included in this study. Educational level was found by Rosenman et al. (1975) to be inversely related to coronary heart disease in both age groups (39-49 years and 50-59 years). Annual income was not related to coronary heart disease rates. However, those subjects with a parental history of coronary heart disease and diabetes exhibited higher coronary heart disease incidences in both age groups. Reported occupational-physical activity was not associated with differences in coronary heart disease rates, but those reporting regular exercise had lower coronary heart disease rates than those reporting only occasional exercise. Smoking habits were found to be related to a higher coronary heart disease incidence. No difference in rate of weight gain was observed. Cholesterol, triglyceride, and blood pressure were elevated in those who later developed coronary heart disease. When these variables were controlled, there

was a relationship observed by Rosenman et al. between coronary heart disease and Type A pattern of behavior. In the younger age group, relative risk (odds ratio) which assesses the association between behavior patterns and incidence of coronary heart disease was found to be 2.21 ($p < .001$) prior to control of these other variables and 1.87 ($p < .003$) after control of these variables. In the older group, the relative risk was calculated to be 2.31 ($p < .0002$) before control of the other variables and 1.98 ($p < .019$) after control of these variables.

Because Type A pattern of behavior was documented as a risk factor for coronary heart disease and involved a work component, Caplan, Cobb, French, Harrison, and Pinneau (1975) examined, in a nonexperimental survey, the prevalence of Type A pattern of behavior in the occupational environment as well as its relationship to correlates of occupational success and stress. The sample included a total of 2,010 males from 23 occupational groups from 67 sites. Occupational status varied from physicians to train dispatchers. Tools utilized included a questionnaire designed to measure stress, psychological strain, and personality characteristics and a 49-item Type A scale. Health examinations were completed in a subsample of 390 males in eight occupational groups which included assessment

of coronary heart disease risk factors (cholesterol, triglycerides, and blood pressure). The tests used to analyze the data were not named. However, Caplan et al. found that Type A pattern of behavior was positively correlated with occupational status although no relationship was observed between Type A pattern of behavior and the following variables: work overload, job satisfaction, anxiety, depression, or somatic relationships. The authors concluded that administrators and physicians scored highest on the Type A scale. Among the blue collar occupational groups, the tool and die workers had the highest scores, while machine paced workers had the lowest scores.

Type A pattern of behavior was found by Mettline (1976) to be significantly correlated to occupational status as well as rapid career advancement in a nonexperimental study which included 953 white collar, middle class males from five different work organizations. Occupational status included administrative and professional staff of a state health agency, an urban utility company's supervisory personnel; officers from industrial and trade unions, a major private university faculty, and the administrative officers of a large banking corporation. Tools utilized in this study included the Jenkins Activity Survey (JAS) as well as a tool which measured rank, level of occupational

prestige, and level of income. Multiple correlation and regression analyses were performed to assess effects of the independent variables on each of the JAS factors. The author reported that employees who perceive their employer as possessing high expectations in regards to quality and quantity of work performed and for competitiveness with which the work is approached had higher scores on the JAS (Type A behavior scale). The author concluded that Type A pattern of behavior is "integral to the modern occupational career" (p. 367).

Type A pattern of behavior was found by several researchers (Shekelle, Schoenberger, & Stamler, 1976; Waldron, Zyzanski, Shekelle, Jenkins, & Tannenbaum, 1977; Zyzanski, 1978) to be positively correlated in both males and females to socioeconomic status as defined by education and occupation. The sample in this study included 5,347 men and women who were initially surveyed in the Chicago Heart Association Detection project from January, 1972 through January, 1973. Included were 3,667 white males, 1,149 white females, 265 black males, and 266 black females, all between 18 and 64 years of age. All of the participants were employed at manufacturing, trade, and service industries. Tools utilized included the Jenkins Activity Survey.

Statistical tests employed to analyze the data in this study, according to Shekelle et al. (1976) Waldron et al. (1977), and Zyzanski (1978), included the factor analysis. Correlation coefficients were tested using the Fisher r to z transformation test for independent groups. Three multivariate ANOVAs were performed to determine the degree to which the Type A score and the factors scores were influenced by age, sex, educational and race differences. T -tests were computed to measure significant interaction effects.

The researchers (Shekelle et al., 1976; Waldron et al., 1977; Zyzanski, 1978) reported several conclusions. Type A scores tended to be lower for older age groups and significant age-education interaction for job involvement was observed. Men in the 18-25 year age group were found to have higher Type A scores than females in that group (significant at $p \leq .01$, t -test). No substantial sex differences were observed in reported feelings of time pressure and tendency to rush. More educated whites had significantly higher Type A and speed and impatience scores than less educated whites. More educated women were observed to have higher Type A scores than less educated women. No differences were observed when t -tests were employed between scores of single females in comparison to

those who were married. Employed white females were observed to have peak mean values of Type A scores and speed and impatience scores between the ages of 30-35 years. Higher Type A scores were found in men for the ages of 18-25 than for women in the same ages, but these scores dropped as the individuals got older. Employed females were found to have higher Type A scores than females who were housewives. Finally, the authors reported that job involvement scores were found to be positively correlated with education, income, and occupational status with correlation coefficients of $r = .3$ to $r = .5$ observed.

In a longitudinal study which took place over a 5-year period, Howard, Cunningham, and Rechnitzer (1976) examined the relationship between pattern of behavior and managerial stress. The sample included 236 male top managers from 12 Canadian companies. Tools utilized included the structured interview and the Jenkins Activity Survey to assess pattern of behavior. Stress factors of the managers were evaluated by a factor analysis of a 31-item job questionnaire which included ambiguity, locked in, stagnation, isolation, and contentment. Blood pressure measurements were also monitored as well as levels of cholesterol and triglyceride.

Howard et al. (1976) found that Type A pattern of behavior was most prevalent in the 36-55 year old group.

The researchers also observed that Type A pattern of behavior was related to income but not to educational status. In fact, Type A pattern of behavior was found to be more prevalent in those with lower educational status. Among the 12 companies, 50 (76%) employees were classified as Type A. Of those companies with the highest growth rate, 66% of the managers were classified as extreme Type As, while in those companies with the lowest growth rates, 56% were classified as extreme Type As. Thus, the authors concluded that Type A pattern of behavior was related to growth rate of the company.

Differences in work habits were also observed by Howard et al. (1976). The extreme Type A subjects in their study were observed to put in longer work weeks, work more hours per week, and travel more days per week. No differences were observed among Type A and B managers in regard to job satisfaction. Of the five stress factors in this study, significant differences between Type A and Type B managers were observed on the locked in and contentment scales; Type A subjects scored lower than Type B subjects which indicated they experienced heavy workloads, work competition, difficulty in satisfying conflicting demands, and supervisory responsibilities. The Type A managers also had higher blood pressures than those with Type B pattern of behavior.

Subjects exhibiting extreme Type A pattern of behavior had higher cholesterol and triglyceride levels and included a larger number of smokers. Statistical analysis included calculation of factor scores and mean factor scores for each behavior pattern.

Although most of the literature has been concerned with coronary heart disease in relation to pattern of behavior, in a study done by Rose, Jenkins, and Hurst (1978), pattern of behavior and health changes were examined. The sample included 388 male air traffic controllers. The Jenkins Activity Survey, monthly health and psychological symptoms checklist, medical examinations, and observations of each participant during working hours were used to collect data. Statistical treatment of the data was not reported. However, the authors reported that individuals with higher Type A scores also had higher rates of illness. Illnesses which were found to be prevalent among the Type A air traffic controllers included respiratory, acute gastrointestinal, and nonspecific viral illnesses as well as injuries. The largest single chronic disease identified was hypertension. It was also observed by these researchers that air traffic controllers who developed hypertension over the course of the study had scores on the JAS indicating Type B pattern of behavior. This finding, according to the

authors, suggested that those individuals with Type B pattern of behavior develop hypertension when placed in a situation or an environment, such as air traffic control, where they cannot control the level of job pressure and do not have an outlet for these job pressures.

Although Type A pattern of behavior appears from the literature to be more prevalent in men than women, researchers (Blumenthal et al., 1978; Waldron, 1978) have shown that Type A pattern of behavior as assessed by structured interviews and the Jenkins Activity Survey does correlate with coronary atherosclerosis and incidence and prevalence of coronary heart disease in both groups. In an experimental study, Waldron and associates (Waldron, 1978; Waldron et al., 1978) examined the relationship between housewives and employed women in relation to pattern of behavior.

The sample consisted of two groups (Waldron, 1978; Waldron et al., 1978). The first group included 45 females selected from a census list. These women were white, aged 40-59, lived in a middle-class neighborhood in a suburb of a major northeastern city, and had a median education of trade school or business college. This group consisted of the housewife group whose husbands' or former husbands' median occupation was administrative personnel, proprietor of small

business, and semi-professional. Of this group of females, 71% were employed for pay at least a few hours a week. The second group of 47 subjects were women in the 40-59 year old range who were members or attenders of a Protestant church in a nearby neighborhood of the same suburb. The median education of this group included some college, and the husbands' median occupation included business manager, proprietor of medium sized business, or lesser professional. Of this group, 65% were employed at least a few hours a week.

Tools used by Waldron and associates (Waldron, 1978; Waldron et al., 1978) included the Jenkins Activity Survey and the structured interview technique which was taped for assessment of pattern of behavior. A brief questionnaire with questions concerning occupation and education of the participant, husband, and parents, her voluntary activity, and number of children was used. At the close of each interview, the respondent's blood pressure was measured. Data analysis included an ANOVA to assess the relationship between Type A pattern of behavior and the independent variables. Relationships between blood pressure and independent variables were tested separately for each sample using the Fischer exact probability test with $p \leq .05$. Interview ratings were dichotomized in a similar way.

Pearson correlation coefficients were also obtained. The researchers concluded that Type A pattern of behavior was positively correlated to women between the ages of 40-59 years who were employed. Additionally, the women with higher educational status who were employed full time had higher Type A scores ($p = .02$) than women were were employed part time. Results of the anxiety scale were not significant.

Perception of time has been described as another component of Type A pattern of behavior. According to Friedman and Rosenman (1959), individuals with Type A pattern of behavior are unable to accomplish the desired number of goals because they do not feel they have time to accomplish these goals. Researchers (Bortner & Rosenman, 1967; Glass, 1977; Glass, Snyder, & Hollis, 1974)) have examined perceptions of time. In their studies, these researchers concluded that individuals with Type A pattern of behavior underestimate time, while those with Type B pattern of behavior overestimate time. According to the authors, by underestimating time required to meet certain goals, those individuals with Type A pattern of behavior feel themselves to be in a chronic struggle with time.

Glass, Synder, and Hollis (1974) examined behavioral consequences of a sense of time urgency in an experimental

study. Their sample included 40 randomly selected male students enrolled in an introductory psychology course at the University of Texas who had taken the Jenkins Activity Survey for assessment of pattern of behavior. The 40 subjects were randomly assigned to either the control group or the slow down group. Each participant was paired with a confederate who was a student in the control group unaware of the first participant's Type A/B rating. This pair was then instructed to work together.

The researchers (Glass et al., 1974) presented a consensus on a series of life dilemma decisions. With one half of the subjects, the confederates deliberately slowed the discussion, while with the other half, the confederates permitted the discussion to proceed without delay. Type A subjects in the control group displayed significantly more overt signs of irritation and impatience than Type A subjects in the control condition or Type B subjects in either group. An ANOVA was used with A/B and slow-down versus control variables as between factors, and decision item categories. Results indicated greater impatience and irritation among the Type A subjects ($F = 11.76$; $p \leq .002$). There was also a significant repeated measures effect ($F = 13.28$, $p \leq .001$) and an interaction between this variable and the slow-down variation ($F = 5.76$, $p \leq .004$). Thus, the

authors found that individuals with Type A pattern of behavior did show signs of impatience and irritability when forced to slow down.

Glass (1977) conducted another experimental study to determine the effect of being slowed on performance. Subjects were 31 (15 Type As and 16 Type Bs) male undergraduate students randomly selected from the upper and lower thirds of a distribution of several hundred Jenkins Activity Survey scores. Participants were given a task in which success or reward was based on low speed of button-pressing response. All individuals worked 45 minutes. Individuals with Type A pattern of behavior received fewer rewards and reported the task as being more difficult than those with Type B pattern of behavior. During the task, 47% Type A individuals and 12% Type B individuals showed tense, hyperactive behavior. Statistical analysis was done by calculating the percentage of reinforcement for the entire 45-minute period and use of a two-tailed Mann-Whitney U test. Those individuals with Type A pattern of behavior received a lower percentage than those individuals with Type B pattern of behavior ($p=.05$). The author concluded that those individuals possessing Type A pattern of behavior exhibited conflict with the slow demands of the task which resulted in increased tension and impaired job performance.

In a second experimental study (Glass, 1977) utilizing the same sample, the individuals were given a warning light which was followed by either the light on the left or right side of the board. Individuals were told as soon as the light on the left or right came on, they should release the appropriate key which corresponded to the light. In this experiment, the time between the left or right light and the time between the trials was long (4-9 seconds). Type A individuals performed less well when forced to wait between the signals and lights. No differences were observed between Type A and Type B individuals in the aforementioned short task, although, according to the author, the hurried actions may have suggested that Type A individuals should perform the short interval reaction time better than those individuals with Type B pattern of behavior. The author concluded that Type A individuals become so impatient and irritated when made to wait that their performance is impaired. According to the author, these and other findings reflect the need of those individuals with Type A pattern of behavior to control their environment by setting the pace and order of activities.

Competitive and hard-driving style is another characteristic of those individuals with Type A pattern of behavior. Research has shown that although both individuals

with Type A pattern of behavior and those with Type B pattern of behavior would work faster or harder at a task when given time limits, those with Type A pattern of behavior would continue to work when no time limits were imposed. A laboratory experiment was done by Burman, Pennebaker, and Glass (1975) to investigate some behavioral characteristics of Type A pattern of behavior. The sample included 62 equally represented male and female students enrolled in a criminology course at the University of Texas at Austin. Using Jenkins Activity Survey scores, 33 students were classified as Type A pattern of behavior, and 27 were classified as Type B pattern of behavior. Participants were randomly assigned to the two experimental treatments. Each participant was tested individually.

The first task in Burman et al.'s (1975) study involved a test of time estimation where each subject was asked to indicate when one minute had elapsed. The next task involved 240 arithmetic problems where each subject was told to complete the first problem before going on to the next. For the second task, half of the participants were told that they would be timed but with no time limit, and the other half were told they had 5 minutes to complete as many problems as they could. The authors found that Type A individuals signaled the passage of time sooner than

individuals with Type B behavior pattern (significant at $p \leq .001$). For the second task, the ANOVA revealed a significant ($p \leq .05$) effect for deadline versus no deadline treatment. Those individuals with Type A pattern of behavior attempted more problems than those with Type B pattern of behavior under the no deadline condition. The authors concluded that individuals with Type A pattern of behavior worked on a task near maximum capacity, irregardless of a time deadline, while those with Type B pattern of behavior exerted more effort only when they had a time deadline. Both time estimation and performance findings were considered to be a coping strategy for maintaining control over the physical and social environment for those individuals with Type A pattern of behavior.

In another study done by Snow (1978), the actual task performance of individuals with Type A pattern of behavior and those with Type B pattern of behavior was found to be equivalent. The author found that those individuals with Type A pattern of behavior reported higher aspirations prior to performing a puzzle test. The author concluded that as the outcome of Type A individuals of underestimation time for tasks is time urgency, the outcome of high aspirations may be a feeling of failure which in turn drives them on.

The hard-driving behavioral style which characterizes those individuals with Type A pattern of behavior has been observed in speed or aspirations of work as well as in physiological arousal. Numerous researchers (Dembroski, MacDougall, & Shields, 1977; Dembroski et al., 1978; Goldband, 1979) have concluded that those individuals with Type A pattern of behavior show higher increases in blood pressure and heart rate than those with Type B pattern of behavior when challenged to perform well on perceptual motor and cognitive tasks.

An experimental laboratory study was done by Dembroski et al. (1977) to assess changes in heart rate and blood pressure in Type A and Type B individuals while they participated in a reaction time task in which the instructions emphasized the necessity for accurate, rapid performance. The sample of 24 male college students aged 18-22 years was selected from a larger pool of college students voluntarily participating in an on-going study of environmental determinants of physiological arousal in Type A individuals. Of the sample, 14 were classified as Type B and 10 were classified as Type A by structured interview technique. Baseline recordings of EKG, heart rate, and blood pressure were documented. Each participant was then asked to depress a key when a green light came on as quickly

as possible and when the red light came on to do nothing. Participants were told to pay close attention to the lights as the times between the lights would vary (3-30 seconds between flashes). Sequence and timing of the flashes were programmed to produce an equal number of each. Testing continued until 30 stimuli had been presented.

Dembroski et al. (1977) reported that blood pressure recordings were taken for all participants 30 seconds after the beginning of the task and every 90 seconds thereafter until the end of the task. Heart rate was obtained from 30 second periods prior to each of the baseline blood pressure readings taken during the reaction-time tasks. Differences between Type A and Type B participants were observed in the magnitude of the beat-to-beat variability. Type A individuals were observed to possess greater sinus arrhythmia than those participants with Type B pattern of behavior. During the baseline period, heart rate did not vary between Type A pattern of behavior participants and those with Type B pattern of behavior, but significant differences ($t = 2.64$, $p \leq .02$) in heart rate variability were observed between the two groups. During performance of reaction-time tasks, Type A participants exhibited large and significant increases ($t = 3.72$, $p \geq .01$) in average heart rate, while those Type B participants showed only small,

nonsignificant changes ($t = 1.37$, $p \leq .20$). A statistical comparison of the magnitude of the increases for both groups (change scores) yielded a value of 2.99 ($p \leq .01$). Type A participants also exhibited some higher blood pressures, but this increase was not statistically significant. However, during the performance of the reaction-time task, both groups displayed statistically significant ($p \leq .01$) increases in blood pressures, but the magnitude of the average increases for Type A subjects was greater than that of Type B ($t = 3.28$, $p \leq .01$ --magnitude of change scores). Pearson r correlation coefficients were computed among the various cardiovascular measures separately for the two experimental groups.

The results, as reported by Dembroski et al. (1977), indicated that there was a tendency during baseline for heart rate and systolic blood pressure to be positively correlated for Type A individuals and negatively correlated for Type B subjects. Positive correlations for both Type A and Type B individuals between baseline systolic blood pressure and task increases in heart rate and diastolic blood pressure were found. Additionally, the authors found a tendency for baseline diastolic blood pressure to be negatively correlated with task increases in heart rate, systolic blood pressure and diastolic blood pressure for

Type A subjects and positively correlated with increases in these measures for Type B subjects.

In another experimental study, Dembroski et al. (1978), examined the behavioral attributes which are most predictive of coronary heart disease to determine if these behavioral characteristics were also predictive of sympathetic autonomic nervous system response to performance challenges. Fifty male college student volunteers, aged 18-22, were challenged to respond rapidly and accurately to three tasks involving either perceptual-motor or cognitive skills, while the experimenter monitored blood pressure, heart rate, and galvanic skin potential. Prior to participation, each subject had completed the Jenkins Activity Survey and a diagnostic interview; one-half the subjects completed the JAS prior to the interview, and the other half completed the JAS after the interview. Physiological testing was completed from 1-5 weeks after completing the JAS and interview.

Dembroski et al.'s (1978) method of testing consisted three tasks: a choice time-reaction task, an electronic television game similar to handball, and a series of difficult anagrams. Prior to the first task and between each subsequent task, respondents were monitored as to blood pressure and heart rate. At the conclusion of the

experiment, each respondent was asked to complete a questionnaire dealing with his perceived emotional and physiological states during each of the tasks. For each task, the participant was asked to rate on an 11-point scale the degree to which he experienced the following states: irritation, enjoyment, physiological arousal, feelings of success, anxiety about doing well, and feelings of confidence.

Data analyses were reported by Dembroski et al. (1978). Tape recordings previously made of the diagnostic interviews were scored using a 5-point scale for attitudinal dimensions and a 3-point scale for content dimensions. Three voice styles were identified: Loud and explosive, rapid and accelerated, and response latency. A Pearson r was calculated for each dimension. Data analysis revealed no group differences in galvanic skin potential for any task condition. Blood pressure data analysis revealed several findings: There were no baseline differences among groups on either systolic or diastolic blood pressures. All groups showed significant ($p \leq .05$) within group increases in the task values of systolic and diastolic blood pressure. The mean magnitude of the change scores for systolic blood pressure varied significantly among groups, with Type A showing the largest increase (19.8 mean magnitude) and Type

B subjects the smallest (7.8 mean magnitude). And finally, no differences in groups in change scores of diastolic blood pressure were seen. According to the authors, heart rate data analysis indicated similar findings, with Type A showing the largest increases over baseline and Type B showing the smallest increases over baseline.

Dembroski et al. (1978) concluded that participants with Type A pattern of behavior showed significantly ($p \leq .05$) greater cardiovascular changes indicative of sympathetic autonomic nervous system arousal than Type B participants. Additionally, according to the authors, the systolic and behavioral components of the Type A pattern were also found to be the best predictors of challenge-induced sympathetic autonomic nervous system arousal.

As stated earlier, Keys et al. (1971) concluded that the physiological measurements of blood pressure obtained from a cold pressor test was a reliable predictor of future coronary heart disease. However, differences in individuals with Type A pattern of behavior and Type B pattern of behavior as far as physiological reactivity is concerned have not been observed under all conditions. When non-challenge instructions were used, several researchers (Dembroski et al., 1978; Lott and Gatchel, 1978; Scherwitz, Berton, & Leventhal, 1980) reported there were no

differences observed in the physiological reactivity of two groups in response to a neutrally worded cold pressor test. Other researchers (Dembroski et al., 1979) reported that studies have demonstrated the even with instructions designed to be challenging, a task may not yield performance or physiological differences between Type A and Type B individuals. According to Dembroski et al. (1979) studies done with female college students did not show the differences observed with males on the choice reaction task with challenging instructions. These findings, according to the authors, suggested that a key determinant of reactivity is whether the Type A individual perceives a task as challenging or nonchallenging regardless of instructions directed towards suggesting such perceptions.

The hard driving behavior and reactivity to challenge which was discussed in the aforementioned studies could be viewed as results of Type A individuals competing with self-imposed limitations and standards. Other studies performed in the laboratory demonstrated differences in competitive situations between Type A individuals and others. In a study done by Friedman et al. (1975), both Type A and Type B individuals engaged in a competitive puzzle for a prize, a bottle of wine. Plasma catecholamine levels were measured before, during, and after the tasks.

Before the task, no differences were found by the authors in norepinephrine or epinephrine levels. During the task, norepinephrine levels of individuals with Type A pattern of behavior were increased 30%, while levels of individuals with Type B pattern of behavior remained unchanged. More recently, Van Egeren (1980), used the zero sum game for his observations. He observed that those individuals with Type A pattern of behavior who were divided into pairs engaged in competitive and antisocial behavior more than pairs of either Type B individuals or pairs of one Type A and one Type B individual. According to the author, Type A individuals were found to show greater peripheral vasoconstriction than Type Bs when competing with Type A partners.

Hostility and aggressiveness are also characteristics of the individual with Type A pattern of behavior. These characteristics were confirmed in the Western Collaborative Group study (Matthews, Glass, Rosenman, & Bortner, 1977) by reanalysis of tape recorded interviews. The sample in this study included 186 men taken from the sample of 3,524 men between the ages of 39-59 who had been involved in the Western Collaborative Group study. These men were employed in one of nine companies. In addition, 124 controls were used who were computer-matched with the experimental

participants based on age. Tools used included the structured interview which assessed pattern of behavior, and tape recorded interviews which assessed the subjects speech style.

Statistical analysis, as reported by Matthews et al. (1977), included four stages. A chi-square was done on case-control group membership by a dichotomous classification of subjects as Type A or Type B. Factor analysis was done on the 44 interview ratings, and factor scores were computed for each subject and the relationship of each factor score distribution with coronary heart disease case-control group membership. The last stage of the analysis compared group means on each of the items loading highest on the factors which were best associated with coronary heart disease. The authors reported that the corrected chi-square was 6.41 which was significant ($p \leq .02$). Of the experimental group, 72.6% were Type As and 27.4% were Type Bs. Of the control group, 52.4% were Type As and 47.6% were Type Bs. Factors which were evaluated and found by the researchers to be statistically significant ($p \leq .05$) from the interview included competitive drive and impatience. T-tests were calculated between the mean factors scores of the cases and controls. The authors reported that results indicated only the factors of competitive drive and

impatience were associated with later onset of coronary heart disease. Therefore, the authors concluded, hostility ratings of the interviews were among the best predictors of subsequent coronary heart disease.

Deliberate frustration and hostility were also examined by researchers (Carver & Glass, 1978; Dembroski et al., 1978; Haynes, Feinleib, & Kannel, 1979; Williams et al., 1978). In Carver and Glass' (1978) experimental study, individuals with Type A pattern of behavior and Type B pattern of behavior were deliberately frustrated by a confederate in the performance of a cognitive skill. Introductory psychology courses at the University of Texas provided 48 undergraduate males students previously having completed the Jenkins Activity Survey, 23 Type A and 25 Type B, who were randomly assigned to either the experimental or control group. Testing was done individually and involved deliberate frustration which consisted of a confederate derogating the participant's performance in the experimental group, while the confederate remained quiet in the control group. Following the frustration, the participant was instructed to teach the confederate a verbal learning task and participants were given opportunity to express their aggression or hostility by administering an electrical shock as punishment for incorrect responses.

Carver and Glass (1978) reported that both Type A and Type B individuals who had experienced frustration administered more intense shocks than those in the control group, but those participants with Type A pattern of behavior administered more intense shocks than those with Type B pattern of behavior. Statistical analysis was accomplished by an ANOVA which revealed one significant effect: mean shock intensity in the instigation groups was higher than in the non-instigation group ($p \leq .01$).

Williams et al. (1978) investigated the correlation between Type A pattern of behavior and hostility. Pattern of behavior was assessed by the structured interview method. Both the structured interview and the Minnesota Multiphasic Personality Inventory (MMPI) were administered prior to angiography. The authors concluded that a positive correlation between Type A pattern of behavior and hostility scales from the MMPI and angiography results when combined were predictive of the most severe coronary artery disease.

Ratings of hostile and competitive speech characteristics in the interview have also been identified as better predictors of blood pressure and heart rate reactivity in perceptual-motor and cognitive tasks than are ratings of loud or rapid speech characteristics (Dembroski et al., 1978). Additionally, in the Framingham Study

(Haynes, Feinleib, & Kannel, 1979), three dimensions of self-reported hostility were examined. These three dimensions were turning anger inwardly, expressing anger outwardly, or discussing anger. Of these three dimensions, the researchers concluded that suppressed hostility in the form of not discussing or expressing anger was the hostility factor that significantly predicted coronary heart disease among working women and white collar males.

The role of environment in relation to the psychological characteristics of Type A and Type B patterns of behavior has been investigated by many researchers. Additionally, the relationship between Type A and Type B individual and their workplace and/or workload has been studied for almost three decades.

Type A pattern of behavior was thought to be a response pattern elicited when certain individuals perceive or experience a challenge from the social or physical environment (Chesney & Rosenman, 1980; Cooper & Payne, 1980). According to Glass (1977), several of the characteristics of Type A pattern of behavior, such as competitive and hostile behavior, are responses to challenges or threats against the Type A individuals' need for control of their environment. A number of laboratory studies (Glass, 1977) have investigated this hypothesis. In

these experiments, 22 college students were given performance tasks in the face of a moderate degree of uncontrollability. Tools utilized included the Jenkins Activity Survey to assess pattern of behavior. Participants were initially exposed to a pretreatment task involving inescapable noise and then given an insolvable cognitive task. Glass concluded that Type A individuals demonstrated heightened performance after inescapable stress, while Type B individuals showed performance decrements from pretreatment levels. Statistical analysis was performed by analysis of variance ($p \leq .001$). The author stated that in face of this moderate lack of control, the Type A individuals appeared to increase their efforts.

The need for control over their environment by Type A and Type B individuals was also examined by Dembroski et al. (1978) in a laboratory study. The authors found that both male and female Type A individuals were more likely than Type B individuals to choose to be in the presence of others while waiting to perform a task which had been described as difficult. When the time arrived to perform the task, more Type A individuals than Type B subjects elected to work alone. The authors concluded that these preferences may be interpreted as reflecting the desire of Type A individuals to be with others prior to the task to

increase their sense of control, but prefer to work alone to exert maximum control over their performance on the task.

In a nonexperimental study, Friedman, Rosenman, and Carroll (1958) examined the relationship between the individual and his or her work environment. Forty male accountants were studied bi-weekly between January and June 1957 to investigate the impact of job stress related to the April 15 income tax deadline. The authors concluded that when studied individually, each participant's highest cholesterol level consistently occurred during severe occupational or other stress, and his lowest level occurred at times of minimal stress. Serum cholesterol levels were examined bi-weekly.

In another experimental study, Caplan and Jones (1975) investigated the relationship between workload and anxiety and anxiety and heart rate. This study took place at a large university and included 73 male computer users. Each participant completed a questionnaire which assessed anxiety, workload, and pattern of behavior. The questionnaire, a 4-item scale developed by Vickers, was administered and heart rate was monitored 23 days prior to shut down of computers. The authors hypothesized that Type A users reporting the highest workload would also have the highest level of arousal. The researchers found a positive

relationship between workload and anxiety and anxiety and heart rate. The authors concluded that correlation between workload and anxiety was significantly ($p \leq .05$) greater for the Type A user than for the Type B user. Correlation between heart rate and anxiety was also greater for the Type A users, but was not significantly higher than that for the Type B users.

Friedman et al. (1960) investigated how Type A pattern of behavior exerts its risks in 24 middle-aged managers selected because of their occupational positions. The structured interview method was used to differentiate the two patterns of behavior, Type A and Type B. Urinary catecholamines excreted during the working day were measured. One-half of the sample was classified as Type A individuals and further selected because their occupational positions were associated with extreme competitive activity and deadlines, admitted to a marked sense of competitive drive and a severe sense of time urgency during the structured interview. The other half of the sample had been noted as Type B individuals on the structured interview and were further selected because they held positions that neither demanded competitiveness nor were characterized by deadlines, nor did they display or report competitive drive or time urgency. Results, as indicated by the authors,

showed a higher level of catecholamines eliminated by those individuals with Type A pattern of behavior, so the hypothesis was retained. The authors concluded that those individuals with Type A pattern of behavior would be more physiologically aroused during the work day than those individuals with Type B pattern of behavior. The authors further concluded as far as Type A pattern of behavior and the risk factor of coronary heart disease, it is the result of the interaction between the Type A individual and his or her environment. Friedman et al. pointed out that the finding of excess catecholamine excretion by men exhibiting Type A pattern of behavior is a phasic phenomena apparent only when they are studied in the appropriate environment.

Parloff, Kelman, and Frank (1973) also examined the relationships between work load, work pressure, and anxiety. The sample included 145 male managers who were differentiated as to pattern of behavior by the structured interview method. Other tools utilized included self-report of work load or work pressures using a weekly workload index and the symptom checklist which was administered on five occasions 2.5 months apart to assess anxiety. The authors reported finding no significant differences between Type A pattern of behavior and Type B pattern of behavior and anxiety. There were also no

differences observed on measured of workload and work pressure in relation to pattern of behavior. However, as noted by the authors, when measures of work load and work pressure were analyzed in conjunction with anxiety, positive correlations were found between work pressure and anxiety and work load and anxiety for Type A individuals. No significant correlations were found for the Type B individuals.

In a study involving a subsample of these male managers, Parloff et al. (1973) also investigated whether an environmental situation over which the Type A individual does not have control would be associated with anxiety. The subsample of 76 managers were randomly selected. Tools included the Work-Environment Scale (WES), developed by Insell and Moos (1974), and the State-Trait Anxiety Scale, developed by Spielberger, Gorsuch, and Lushene (1970). Of the 10 subscales on the WES, only the control subscale showed a significant ($p \leq .01$) difference between managers with Type A pattern of behavior and managers with Type B pattern of behavior. Type A individuals reported their work environment as one in which they were in control, one having significant less external control more often than did the Type B managers.

Parloff et al. (1973) hypothesized that an externally controlled environment would present a threat or challenge to Type A individuals, so Type A subjects on a controlled work setting would experience more distress than Type A individuals in a work setting in which they were in control. To test the hypothesis, the WES control subscale scores obtained by the Type A and Type B managers were divided into thirds which produced a low externally controlled subgroup, a middle subgroup, and a highly externally controlled subgroup. The middle group was defined as providing an optimum fit between the individual needs and those of his work environment, while the other two groups reflected lack of person-environment fit.

Parloff et al. (1973) concluded that the subgroup in the highly externally controlled group scored higher on the STAI Trait anxiety scale ($p \leq .05$) than did the Type B individuals in the low externally controlled subgroup. The authors stated that the hypothesis was supported; Type A managers who have been characterized by a need to be in control experience distress when confronted by an environment that is challenging by being too externally controlled. Type B managers experience anxiety when confronted with an environment that does not offer enough structure, regimentation, and external control.

As reported in the literature, Type A individuals are characterized as hard-driving, competitive, achievement-oriented, and work-oriented individuals with distinct behavior characteristics. As a result, Type A individuals often take on increasing responsibilities and are found at higher levels of their occupational hierarchy than their Type B counterparts. In these high status positions, Type A individuals encounter even more time pressures, conflicting demands, and responsibilities (Chesney & Rosenman, 1980). However, Type A individuals in present day society are often rewarded for their behavior by higher salaries and greater prestige (Caplan & Jones, 1975).

Executive Stress

Managerial stress was identified by Marshall and Cooper (1977) to be caused by seven factors, six of which are external and one which is internal. Factors intrinsic to the job include the following: too much or too little work, time pressures, deadlines, having too many decisions to make, fatigue from physical strains of the work environment (such as assembly lines), excessive travel, long hours, having to cope with the changes at work and the expenses (monetary and career) of making mistakes, working conditions, and work overload.

Research of three decades ago linked working conditions of certain occupations to poor physical and mental health. In an exploratory study done in Detroit's mass production industry in the mid 1950s, Kornhauser (1965) investigated the relationship between mental health and occupation. Subjects included 1,062 workers from various occupations; 407 factor workers gathered from 13 large and medium-sized automotive companies comprised one group, and 655 men from other occupations were included for comparison purposes. The sample was gathered from specified job categories by a systematic sampling procedure utilizing personnel files of a number of companies. A single intensive interview conducted during the second half of 1953 and the early months of 1954 provided the data. Information from the interviews was tabulated, indexes were constructed and relationships were analyzed. Indexes and ratings were completed by adding together arbitrarily assigned weights for coded responses judged to be indicative of the designated characteristic. Each set of total raw scores was then grouped into nine intervals to form the final index score. Kornhauser found that poor mental health was directly related to unpleasant working conditions, the necessity to work fast and expend a lot of physical effort, as well as excessive and inconvenient hours.

Work overload was also identified as a more important stressor for managers than was working conditions. French and Caplan (1973) differentiated work overload into quantitative, which refers to having too much to do, and qualitative, which refers to a working situation in which you are not qualified to do the work. In an earlier study, French and Caplan (1970) found that quantitative overload was strongly related to cigarette smoking. Persons with more phone calls, office visits and meetings were found to smoke more cigarettes than those with less phone calls, office visits, and meetings.

French and Caplan's (1970) sample included three occupational groups of male employees from Goddard Space Flight Center who were administrators, engineers, and scientists selected according to job title and personnel rosters. The administrator and engineer groups were further divided into two additional groups each: administrators in the administrative environment; administrators in the engineering environment; engineers in the administrative environment; and engineers in the engineering environment. Scientists were included in this study because of their low risk of coronary heart disease, which totaled five separate groups. To form these five groups, 70 men were randomly selected and asked to volunteer; 89% (62) men consented.

The average age of the subjects was 40 with two-thirds between the ages of 34 and 47. Following their consent, as stated by French and Caplan (1970), each participant had 30 cc of blood drawn for evaluation of cholesterol, uric acid and glucose; systolic and diastolic blood pressure was measured. Subjects were then asked to complete a questionnaire and mail it back to the University of Michigan; 83% returned the questionnaire.

French and Caplan (1970) reported 10 conclusions based on the results of data analysis. Objective workload as measured by the number of phone calls and office visits an individual received was positive correlated ($r = .64$) with subjective quantitative workload. Pulse rate and cholesterol level were found to be unrelated, however pulse rate was found to be related ($r = .68$) to subjective quantitative overload rather than to objective work load. Cholesterol was found to be related to objective and subjective work load ($r = .43$ and $r = .41$, respectively). No correlation between measures of objective work load and subjective work load was found ($r = .02$, nonsignificant). Cigarette smoking was found to be more prevalent in administrators ($X^2 = 3.94$, $p \leq .05$). Percentage of time spent in responsibilities for others' future was found to correlate nonsignificantly ($r = .08$) but in a

positive direction with cigarettes smoked per day. Objective quantitative overload and number of cigarettes smoked was found to be positive correlated ($\underline{r} = .58$; $p \leq .05$). Cigarette smoking also correlated positively with a person's tendency toward environmental overburdening ($\underline{r} = .36$, $p \leq .01$). Number of cigarettes smoked and number of visits to health dispensary were found to be inversely related ($\underline{r} = .31$, $p \leq .05$). Administrators were found to have higher blood pressure than engineers and scientists; the differences among the groups was significant ($p \leq .05$).

Quantitative work overload has also been identified as a source of stress in managers. In French, Tupper, and Mueller's (1965) study done at a large university, 122 professors and administrators were given questionnaires, interviews, and medical examinations to obtain data on risk factors associated with coronary heart disease. The authors reported that qualitative work-overload was not significantly ($p \leq .05$) related to low self-esteem among administrators, but was significantly related among professors. The greater the quality of work expected of the professor, the lower the self-esteem. Qualitative and quantitative overload was found to be related to achievement orientation. Methods of statistical analysis were not given.

Russek and Zohman (1958) conducted an experimental study which involved 100 coronary patients and 100 controls between the ages of 25-40 years. In this two-group study, the experimental group included 100 patients who had been diagnosed as having a myocardial infarction by EKG studies or by complaints of angina. The control group included 100 unmatched healthy subjects of similar age, occupation, and ethnic origin. Tools were evaluations and interviews during the convalescence period after the myocardial infarction or subsequent months. Health history, habits, diet, hereditary influences, sources of tension, and events preceding the onset of symptoms were examined. Ratios and percentages were calculated. Results, according to the authors, indicated that emotional stress associated with job responsibility appeared to be more significant in etiology of coronary heart disease in young adults than heredity or diet. The authors reported that 25% of the coronary patients had been working two jobs which required 60 or more hours per week due to work overload. Emotional strain was found to precede the coronary attack in 91% of the cases in the experimental group, while similar strain was only observed in 20% of the control group.

Margolis, Kroes, and Quinn (1974) included in their study a representative national sample of 1,496 employed

individuals 16 years or older who worked for pay 20 hours a week or more. Questions on job stress and questions about one's job and attitudes toward work were asked by professional interviewers at the homes of the respondents early in 1973. Scores on six specific job stress indices, role ambiguity, under-utilization, overload, resource inadequacy, insecurity, and nonparticipation, were averaged to form overall job stress scores. Related to overall job stress were the scores on the 10 indications of strain which included: overall physical health, escapist drinking, depressed mood, self-esteem, life satisfaction, job satisfaction, motivation to work, intention to leave job, frequency of suggestions to employer, and absenteeism from work. The distribution of the scores on the 10 indications of strain were divided into low, medium, and high. Standard Z scores and F ratios were calculated.

Margolis et al. (1974) reported that overall job stress was significantly ($p \leq .05$) related to all measures of strain. Stress was found to be associated with poorer physical and mental health. The stronger relationships were found for the strains that were most likely to be associated with perception of job stress, job satisfaction and motivation to work. Correlations were obtained between each of the job stressors and each of the strain measures; underutilization

and nonparticipation were significantly ($p \leq .05$) correlated with all 10 strain indicators. The highest correlation was that between motivation to work and nonparticipation; the greater the lack of participation, the lower the motivation to work. Thus, the researchers concluded that work overload was positively related to a number of symptoms or indicators of stress which included escapist drinking, absenteeism from work, low motivation to work, lowered self-esteem, and absence of suggestions to employers.

Work overload is not always externally imposed; it has been shown that many managers react to overload by working longer hours. In a study reported by Uris (1972), it was found that 45% of the executives investigated worked all day, in the evenings, and on weekends. A further 37% of the executives kept weekends free but worked extra hours in the evenings. No other information was available concerning this study.

Role ambiguity has been identified by Kahn et al. (1964) as an occupational stressor. Role ambiguity occurs when an individual possesses a lack of clarity about the work objectives associated with the role as well as colleagues' expectations of the work role and the scope and responsibilities of the job. Kahn et al. concluded that men who suffered from role ambiguity experienced lower job

satisfaction, higher job related tension, greater futility, and lower self-confidence than those who suffered no role ambiguity.

In their study at Goddard Space Center of 205 engineers, administrators, and scientists reported earlier, French and Caplan (1970) also studied role ambiguity. The researchers concluded that role ambiguity was significantly related to job satisfaction and to feelings of job-related threat to one's mental and physical well-being.

Margolis et al. (1974) also found a significant relationship between role ambiguity and symptoms or indicators of physical and mental ill health. In their sample of 1,496 workers described previously, the stress indicators which were related to role ambiguity were depressed mood, lowered self-esteem, life dissatisfaction, job dissatisfaction, low motivation to work, and intention to leave the job.

Role conflict has also been identified as a stressor and exists when an individual in a particular work role is torn by conflicting job demands or by having to do things that person does not think are part of the job specification. Kahn et al. (1964) found that men who suffered more role conflict had lower job satisfaction and higher job-related tension. These researchers also found

that the greater the power or authority of the individual sending the role messages, the more role conflict produced job dissatisfaction. French and Caplan (1970) found in the Goddard study that role conflict was related to physiological strain as well. The authors telemetered and recorded the heart rate of 22 men for a 2-hour period while they were at work in their offices. The authors concluded the mean heart rate was strongly related to the men's reports of role conflict.

Evaluating a wide variety of potential stressors in relation to occupation was undertaken by Shirom, Eden, Silberwasser, and Kellerman (1973). The sample included 762 male Kibbutz members, aged 30 and above, randomly selected from 13 Kibbutzim throughout Israel. Occupations included agricultural workers, factory groups, craftsmen, and white collar workers. The authors hypothesized that people in managerial and professional occupations were more likely to suffer occupational stress from role related stress and other interpersonal dynamics and less from the physical conditions of work. Tools utilized in this study included a comprehensive medical examination, a short general health questionnaire, laboratory measures of glucose, uric acid, cholesterol and urea, systolic and diastolic blood pressure measurements, measurements of heart rate, measurements of

physical work capacity, standardized physical work capacity, smoking intensity, and ponderosity index. Statistical tests included calculation of means, standard deviations, and correlations with age and risk factors.

Shirom et al. (1973) found that there was a significant relationship between role conflict and coronary heart disease in white collar workers only. The researchers concluded that those occupations requiring greater physical exertion, such as agricultural workers, demonstrated the least amount of role conflict and ambiguity and abnormal EKG findings. Role conflict was also found by the authors to be related significantly to excessive weight for age and height.

Responsibility, both for other individuals as well as for things, has also been identified as an occupational stressor. Wardwell, Hyman, and Bahnson (1964) conducted three separate studies. In the first study a total of 203 white males over the age of 35 were selected from one of six rural counties in North Dakota and were given a 30 minute interview. All of the participants had survived some manifestation of coronary heart disease. A control group which consisted of 406 white males who were randomly chosen by areal sampling also from the total populations of the six counties. Control and experimental groups were matched for

age. The second study included 32 white males, aged 35-64, diagnosed within the last year of having a myocardial infarction. Subjects were all interviewed in their homes for an average of 3.6 hours. The control group in this study consisted of 435 white males, aged 35-64, randomly selected by areal sampling from the total population. Data for this comparison were obtained utilizing a modified interview schedule. The third study consisted of 16 white males, aged 40-60, who had a diagnosis of arteriosclerotic heart disease. They were compared with two aged-matched random samples of white males were were selected by 3-stage areal probability sampling from a slum section of Manhattan. The first comparison group consisted of 128 and the second comparison group consisted of 176. These three studies represented a continuum from rural to highly urban environment. Statistical analysis included calculations of ratios on all variables examined. The ratios of observed to expected were calculated. The researchers concluded that responsibility for people was more likely to lead to coronary heart disease than responsibility for things.

Other researchers (French & Caplan, 1970; Terhure, 1963) have also concluded that physical stress is linked to age and level of responsibility. In a study conducted by Pincherle (1972), 2,000 executives attending a center for a

medical checkup for managers were found to exhibit evidence of physical stress. Stress was concluded to be linked to age and level of responsibility. Eaton (1969) concluded that as an executive ages, he may be troubled by stressors other than increased responsibility. These stressors may include recognizing that further advancement is unlikely, increasing isolation and narrowing of interests, and awareness of approaching retirement.

Although other occupational stressors, such as having too little responsibility, lack of participation in the decision-making process, lack of managerial support, inability to keep up with increasing standards of performance, and coping with rapid technological changes, have been identified by some authors, little research supports the significance of their relationships. Kay (1974) suggested that some occupational stressors may be felt more at middle management levels than at top management levels.

Relationships within the organization have also been identified as a source of stress. This category involves relationships with one's boss, subordinates, and colleagues. According to some authors (Argyris, 1964; Cooper, 1973), although little research has been done in this area, behavioral scientists have suggested that good relationships

which exist between members of a group are important factors when considering individual and organizational health. Poor relationships have been defined as those which include low trust, low support, and low interest in listening to and trying to deal with problems that confront the organizational member (French & Caplan, 1973).

Researchers (Caplan, 1970; Kahn et al., 1963) have also concluded that mistrust of individuals one works with was related to high role ambiguity. Additionally, this high role ambiguity may be linked to poor communications between people and psychological strain as evidenced by low job satisfaction as well as feelings of job-related threats to one's well-being.

In an exploratory study, Buck (1972) examined attitudes and relationships of workers and managers to their immediate supervisor. The sample included 36 managerial and clerical employees who worked for an iron manufacturing company in New York state in 1960. Tool used included a job attitude, job pressure questionnaire, personal interviews, observation while at work and additional data which was secured from personnel files, and the Fleischman's Leadership Questionnaire on consideration and initiating structure. The additional data included age, years of education, length of service, number of children, status in organization, and

whether the individual had a staff or line responsibility. Chi-square and correlation coefficients were calculated. Buck concluded from the findings that individuals who reported feeling their boss was low on consideration also reported feeling more job stress.

Stress has also been found to be caused by a lack of social support in difficult situations (Lazarus, 1966). According to Morris (1975), the efficient manager must bring all relationships, those with colleagues, juniors, seniors, and opposite members, into a dynamic balance in order to be able to deal with the stress of a managerial position. In a research study, Minzberg (1973) examined exactly what managers do. The sample included chief executives, and although the total number was not reported, percentages were calculated and reported. The author stated that in large organizations, 22% of the time was spent at desk work, while the rest of the manager's time was spent by telephone calls (6%), scheduled meetings (59%), unscheduled meetings (10%), and other activities (3%). In small organizations, according to Minzberg, basic desk work consumed 52% of the manager's time, but 40% of the time was devoted to actual face to face interactions.

Two groups of stressors were identified when considering career development (McMurray, 1973; Sleeper,

1975). These groups were lack of job security and status incongruity. When considering lack of job security, fear of redundancy, obsolescence or early retirement were included. For example, according to the authors, management is becoming a younger man's world. Society is rapidly changing and this is projected to mean individuals may need to change careers during their working life. The authors pointed out that research suggests older workers seek stability, and unless those older managers adapt their expectations to suit new circumstances, occupational stress may become a common occurrence. According to Cooper and Payne (1977), many managers feel their career progression is of overriding importance. Promotion not only leads to more money earned, but also to a higher level of status and new challenges. Early in a manager's career, as noted by the authors, the ability to come to terms with a changing environment is rewarded by the company. Authors (Constandse, 1972; Levinson, 1973) pointed out that at middle age and middle management levels, a career becomes more problematic, and most executives find their progress slowed and job opportunities become fewer. This stage has been referred to as male menopause.

Research has been undertaken to assess one type of career development stress, labeled status congruence, which

means the more systematic matching of one's individual advancement with his experience and ability. Arthur and Gunderson (1965) compared the promotional attainments of Navy men who were hospitalized with mental illness in an experimental three-group study which took place over a 2-year period. Group 1 included 2,939 Navy men who had been hospitalized for a psychiatric disorder, Group 2 included 245,840 Navy men at large, and Group 3 included a 506 select group of volunteers who worked for the Antarctic service. The mean age of the men in the total sample was 27.8 years. Distribution of the variables was as follows: (1) race--93% Caucasian, 6% Negro, 1% non-Caucasian; (2) diagnosis--10% psychosis, 31% psychoneurosis, 45% behavior and character disorders, and 14% transient personality disorders.

Arthur and Gunderson (1965) compared data from the hospitalized patients with data from all enlisted persons in pay grades E-4, E-5, and E-6 on active duty during the same period and with similar data from the volunteers. Distribution for length of service prior to hospitalization was obtained for all groups. Years of service were grouped to provide approximate distribution for each sample on that variable, and percentages were calculated for each length of service category within each pay grade. A further comparison was made of differences among the groups in

percentage of men with less than two years of service who had attained pay grade E-4.

Promotional lag was found by Arthur and Gunderson (1965) to significantly relate to psychiatric illness. The researchers found that there was a relationship between advancement in pay grade and length of service for each of the three populations studied. Among the hospitalized group, those with multiple admissions were more retarded in comparison to those with a single admission ($x^2 = 4.1$, $p \leq .05$).

Further study was done by Erikson, Pugh, and Gunderson (1972) to evaluate a model of status congruency in relation to life stress and job satisfaction. This sample of 2,080 Navy enlisted men serving aboard three cruisers included six different occupational groups: 71 electronic technicians, 112 radar/sonar technicians, 358 engineering and hull workers, 176 administrative and clerical persons, 343 deck personnel, and 1,020 nonrated crew members with undesignated duty assignments. The subjects were divided into groups according to occupations. A questionnaire designed by the Navy medical neuropsychiatric unit to obtain basic demographic and occupational information and a 42-item questionnaire, the Schedule of Recent Experiences, were completed by the subjects. The four variables included on

the congruency model were paygrade (level of advancement), duty time (job experience), age, and marital status.

Erikson et al. (1972) reported using a cluster technique to combine various levels of each of the four variables in order to determine distinctive patterns and degrees of congruence. Data for each of the six occupational groups were entered into the cluster analysis one group at a time. Each level of pay grade, age, and marital status was treated as a separate dichotomy and clusters were created by grouping together the variables that tended to correlate in a positive manner and by separating those that tended to correlate in a negative manner. A relationship between status congruence and each criteria measured was examined by computing the ETA coefficients. The ETA between job satisfaction and congruence was .085 ($p \leq .01$), and the ETA between life stress measures and congruence was .083 ($p \leq .01$). Pearson product-moment correlations were computed between the criteria and congruence measure. Only the linear trend between job satisfaction and congruence was significant ($r = .07$, $p \leq .05$). The researchers concluded that Navy personnel experienced more job satisfaction when their rates of advancement exceeded their expectation, and dissatisfaction increased as advancement rates were retarded.

In a more recent study, Erikson, Edwards, and Gunderson (1973) investigated status congruency related to incidence of psychiatric disorders and military effectiveness. The sample included 10,302 Navy enlisted men during the years of 1965-1968. Three groups were involved which included 3,586 psychiatric outpatients, 3,601 psychiatric inpatients, and 3,078 nonpsychiatric controls. The men were then classified into occupational groups resulting in six subgroups. A questionnaire designed to obtain basic demographic and occupational data was used; personnel and medical files were utilized to determine psychiatric and performance effectiveness. The four variables mentioned in the previous study were also included in this study. Additionally, the cluster technique used in the previous study was used in the same manner. In addition, means and standard deviations of status congruency scores were computed for the psychiatric outpatients, psychiatric inpatients, and control group; means were $-.17$, $-.14$, and $+.10$, respectively. A one-way ANOVA indicated differences among groups ($F = 85.86$, $p \leq .001$). Comparison of inpatients and outpatients showed no significant differences. Psychiatric patients were classified according to disposition: those returning to active duty (1,918; $\bar{M} = -.09$); those hospitalized (508; $\bar{M} = -.19$); character and behavior disorders (626; $\bar{M} = -.29$); and

recommended discharges for other reasons (534; $\bar{M} = -.09$). A one-way ANOVA resulted in significant differences in criterion measures among the subgroups ($F = 6.16$, $p \leq .01$). Duncan's multiple range tests indicated significant differences between outpatients returning to active duty ($p \leq .005$) and those recommended for administrative separation ($p \leq .001$). A T -test was calculated and indicated that congruency scores differentiated the successful outcomes from the failures ($T = 2.92$, $p \leq .01$). Thus, Erikson et al. found that status congruency was negatively related to the incidence of psychiatric disorders and positively related to military effectiveness.

Another source of stress is being a member of an organization which causes a threat to an individual's freedom, autonomy, and identity. Problems which individuals have encountered in these areas include little or no participation in the decision-making process, no sense of belonging, lack of effective consultation, poor communication, and office politics (Cooper & Marshall, 1977). Early research done in this area was focused on the effect on production and attitudes of workers. In the Goddard Study, French and Caplan (1970) stated that individuals who reported greater opportunities for participation in decision making also reported greater job

satisfaction and higher feelings of self-esteem. Other researchers (Buck, 1972; Coch & French, 1948; French, Israel, & As, 1960; Kasl, 1973; Margolis et al., 1974; Neff, 1968; Quinn, Seashore, & Mangione, 1971).

Extraorganizational sources of stress include all factors outside and life inside the organization that may put pressure on the manager (Dohrenwend & Dohrenwend, 1974; Pahl & Pahl, 1971). These sources may be family problems, life crisis, financial difficulties, conflict of personal beliefs with those of the company, and conflict of the company with family demands. According to Packard (1975), most research has been directed towards the executive's relationship with family. Two main problems have been identified: (1) The executive does not have time to cope with other people's needs; frequently he needs support from others to cope with general day-to-day occurrences (housekeeping chores, maintenance), to relieve stress when possible, and to maintain contact with the outside world. (2) Often a result of the first problem involves a spillover of crisis or stressors in one system which will affect the others (Packard, 1975).

Researchers (Barber, 1976; Pahl & Pahl, 1971) investigating marriage patterns have identified that while most executives' wives stated they find security in their

husbands, the husbands do not state they find security in their wives. Gowler and Legge (1975) have named this type of relationship a hidden contract in which the wife agrees to act as support to her husband so that he can fulfill the demanding job to which he aspires. Handy (1975) noted that this relationship is necessary for a successful career.

Handy (1975) examined executives to identify successful marriage-role combinations. Twenty-two couples, top executives in mid-career and their wives, were studied by interview technique. Although statistical analysis was not given, the author concluded that the most frequent pattern was the thrusting male-caring female relationship. The second most frequent combination was the involved-involved relationship which consisted of a dual career pattern with emphasis on complete sharing. According to the author, this type of relationship requires energy, but is generally fulfilling to both parties. However, due to the energy involved, it may prove to be so successive that neither party is satisfied.

In another report, Beattie, Darlington, and Cripps (1974) presented difficulties an executive possesses in maintain a balance between family demands and work. These authors suggested that the executive must use restraint to

maintain distance between his wife and the organization so that she will not be in a position to evaluate his choices.

In Western society where mobility has become a way of life for many, home conflicts have become critical. The effects of mobility on managers' wives and families have been examined in many studies. Most authors agree that whether the wife is willing to move or not, she bears the brunt of the relocations and most husbands do not appreciate what this involves. According to Immundo (1974), increasing divorce rates can be seen as the upwardly aspiring manager achieves success while his wife remains unskilled and stays at home. Seidenberg (1973) identified a rise in the ratio of female to male alcoholics in the United States from 1:5 in 1962 to 1:2 in 1973. Many corporate wives describe feelings of loneliness and frustration, and there has also been an increase of teenage delinquency and violence observed (Immundo, 1974; Seidenberg, 1973).

Investigators (Guest & Williams, 1973; Pahl & Pahl, 1971) have found that many mobiles retreat into their nuclear families. Due to the short period of time they spend in each location, managers do not become involved in local affairs; their wives, however, do become involved. In their survey, Pahl and Pahl (1971) concluded that involvement of the executives' wives is a necessity to

compensate for their husbands' ambitions and career involvements. The way in which a wife adjust to her new environment can affect her husband's work performance, so, according to the authors, it is to the company's best interest that the wife become involved. Additionally, in a survey of 1,800 executives in 70 countries, Guest and Williams (1973) concluded that the two most important influences on overall satisfaction with overseas assignments were the job itself and the executives' wives' adjustment to the foreign environment. The authors reported that clinical evidence suggests that one partner's problems may contribute to the mental ill health of the other.

Although the majority of the research done on executives has involved males, females in the 1980s are entering many of the formerly male-dominated professions. Brown (1982) reported that statistics show that 15% of the 1980's management trainees are females, as compared to only 1% in the mid-1960s. Other authors (Cooper & Davidson, 1982; Davidson & Cooper, 1980) noted that, while it appears easy for females to gain employment at lower levels of the organization, it is difficult for them to secure positions in upper, middle, and senior management.

Cooper and Marshall (1977) stated that each individual reacts differently to pressures at work. Some individuals

are more characteristically predisposed to stress; they are unable to cope or adapt to the stress-provoking situation. According to the authors, factors contributing to inability to cope or adapt include personality, motivation--being unable or unprepared to deal with problems in a particular area of expertise and/or fluctuations in abilities and insights into one's own motivations and weaknesses. The authors emphasized that personality characteristics between high and low stressed individuals play an important role in coping behaviors.

Behavior Modification

All literature reviewed supported the idea that executives, because of their personalities, lifestyles, and demanding careers, are in fact under stress and therefore are at risk to develop one or more of the stress-related illnesses. There are legal implications in the job-stress equation. An employer is liable for disability that occurs because of the work setting (McLean, 1979). According to authors (Lesser, 1967; McLean, 1979), worker compensation is the system that is set up by statutes in states and other jurisdictions to provide medical expenses and a weekly benefit that arises from industrial accidents. Worker compensation laws now make an employer legally liable for an employee's mental illness, whatever the cause if it is

aggravated, accelerated, or precipitated to the point of disability or need for medical care by any condition of employment. This is true regardless of whether the employee participated in production of conditions of employment that may have aggravated or accelerated the factors involved. According to the authors, prior to 1960, no claims were awarded; however, since 1960, many cases have been awarded for emotional or job related stress.

The common denominator to most occupational stress is change. Gardell (1975) pointed out that this can refer to any type of change--promotion, demotion, job transfers, or the changing nature of work itself. Rapid working technology and the obsolescing of skills contribute to rapid change in the work environment, and the pace of change is increasing. As noted by the author, change in society also has had an impact on the work environment.

Levi (1974) stated that work is a part of the process of coping with life stress. Without work, there is a potential for boredom and meaninglessness to develop. Work is often the primary means in which a person feels useful in life and through which that person develops an identity. As Levi stated, if people did not work, they would be deprived of the only viable means of coping with non-work related stress.

The impact of life events upon an individual varies, according to Nelson (1974), as a function of the intensity and magnitude with which these events are perceived, the unpredictability or suddenness with which an event occurs, or the degree of preparedness of the individual as a result of previous experience. Both Nelson (1974) and McLean (1979) pointed out that an individual's role in a particular setting, the perception of the expectations, the need of the individual by others, and the perceived ability to control or alter the situation are important factors in understanding how life events are interpreted and what reactions or coping mechanisms are evoked. Wolff (1974) indicated the context of work can often be made supportive and thus individual vulnerability can be reduced. Most researchers, according to Wolff, purport that while prevention programs may have some benefits, the major thrust of stress management must be ongoing. The emotional climate of the organization should reflect concern for the needs of its employees in order for the employees to blend successfully with the purpose of the organization. According to McLean (1979), in order for the above to occur, the organization's goal must provide a climate in which the employees perceive themselves as valued and where there is communication which allows their individual needs to be met.

Due to changes in economy and the work environment, organizations must learn how to plan for alternatives and successful adaptation (Quick & Quick, 1984). The authors suggested plans should involve developing ways of coping for the individual and for the organization. The first thing any individual or employer must do is identify behaviors which indicate stress. The authors pointed out that one of the first signs of stress overload in an employee is a change in behavior.

Although there are many things organizations can do to decrease their employees' levels of stress, the individual's approach to stress management was explored in this review of literature. According to Cooper (1981), many companies are providing health and counseling facilities to ensure a healthy executive because the companies have realized the cost of stress-related illnesses to the organization, such as expense of days lost to illnesses, lost opportunities, massive increase in claims for worker's compensation due to stress at work. The authors stated that extensive keep-fit programs have been set up for employee use on a volunteer basis.

Exercise has been recorded as a health promoting technique since 1553 (Kilgour, 1960). The first company-supported recreation and fitness program was started in 1904

(Duggar & Swengros, 1969). Popularity of physical exercise as a means of stress management is reflected in nearly every publication on stress management. According to Quick and Quick (1984), over the last 20 years, corporate fitness programs have been set up to make regular physical exercise more widely available to the working population. The authors noted this has been done partially in response to numerous lawsuits over job-related stress.

Physical exercise includes a wide variety of activities. Quick and Quick (1984) reported that although most of the documentation consists of individual statements, a few researchers have confirmed benefits of physical exercise. Personal and psychological benefits gained from regular exercise include decreased muscle tension, heightened mental energy; improved feelings of self-worth; greater sense of well-being; improved memory; greater self-awareness; decreased absenteeism; improved performance; and lower attrition.

In an experimental study using a two-group design, Lynch et al. (1973) concluded that persons who exercised regularly exhibited reduced measures in anxiety, depression and hostility when compared to their pre-exercise scores. The sample included middle-aged men who were divided into two groups. The first group participated in a 19-session

exercise program which consisted primarily of jogging; the other group did not participate in any exercise. Although measurement tools used and statistical information were not reported, the authors did stated the first group (exercisers) showed significant reduction in anxiety, depression, and hostility scores when compared to the non-exercise group and to their own pre-exercise scores.

An experimental study was done by Griest, Klein, Eischens, and Faris (1978) at the University of Wisconsin. The sample included 28 men and women who ranged in age from 18 to 30 and who had demonstrated clinically significant depression. These individuals were randomly assigned to one of two groups. The first group was assigned to jogging and the second group was assigned to psychotherapy. The authors reported that six of the eight patients assigned to jogging who continued it for 10 weeks recovered from their depression, which was better than that observed for those assigned to psychotherapy. Thus, these authors concluded that the group that exercised recovered from their depression more rapidly than the group who did not exercise.

The above literature does indicate benefits of exercise on those who are already ill. Cooper (1981) pointed out that prior to investing a lot of money into development of programs, several companies did pilot programs to determine

if their employees would in fact benefit from such an exercise program. In a research program done by Canada Life Assurance Company and North American Life Assurance Company to determine effects an executive keep-fit program would have on their managers, 1,125 managers from both companies were enrolled in a systematic physical fitness program. Measurement tools were not reported, however, according to Cooper, results indicated a 22% drop in absenteeism (a savings of \$200,000 per year). Additionally, a 3% rise in productivity and a more positive attitude towards work as well as better relationships with their bosses and subordinates were reported.

Other techniques used by companies to decrease stress included sensitivity training which is the method of enabling individuals to see themselves as others see them. Cooper (1975, 1976) stated this training can assist the individual to attain a more realistic perception of self and possibly help to better cope with some of the stressors. Yoga and transcendental meditation, according to Cooper and Marshall (1977), have also been utilized in slowing down the physiological processes and thus assisting the individual to relax. Still another method, as reported by the authors, is to include a stress management course as part of the management training program; this would assist the new

manager in identifying and dealing with the stressor before a disability occurs.

Personality and lifestyle were cited earlier as contributing to increased levels of stress, and those with Type A pattern of behavior are susceptible to a great deal of stress due to their personality characteristics. Yates (1979) noted that the literature support the idea that any individual who wishes to change his pattern of behavior may do so by using principles of behavior modification.

In one pilot program involving psychological treatment, a combination of two behavior modifications programs were used by Suinn, Edie, and Brock (1975). The first program was an anxiety management training program which trained individuals to identify physical and psychological signs and symptoms of stress and eliminate them in treatment for the behavior pattern. The second program was a visual-motor behavior rehearsal which assisted a patient in acquiring new adaptive coping patterns under controlled imagery conditions. According to the authors, this program has been successfully applied to retraining of executives.

A nonexperimental survey was done by Mettlin (1976) to assess the extent to which Type A pattern of behavior is amenable to change. A total of 943 males, average age of 42, were secured from the faculty of a major private

university, administrative and professional staff of a state health agency, supervisory personnel of an urban utility company, one officer from each of a large variety of trade and industrial unions and the administrative officers from a large banking corporation. Tools included the Jenkins Activity Survey to measure pattern of behavior, the NORC Index to measure occupational prestige, a questionnaire to measure 15 variables related to social background, organizational status, and occupational careers. Statistical analysis included calculation of standardized regression and multiple correlation coefficients, zero order correlations, means, and standard deviations. Metlin concluded that Type A pattern of behavior is integral to the modern occupational career and attempts to change it may conflict with valued aspects of the individual's career and therefore may be met with resistance.

An experimental study was done by Suinn and Bloom (1978) to investigate a behavioral intervention method with emphasis on stress management. The sample included 2 females and 12 males, recruited through ads in a local newspaper, who perceived themselves as fitting Type A behavior characteristics. Their average age was 38 and all were employed in managerial professional positions. Tools included a health questionnaire, blood pressure

measurements, psychological testing (JAS, STAI), and blood samples for lipid analysis. Two groups were formed of seven individuals each who were matched on the basis of the STAI Trait anxiety means. One group was a control group, while the other group completed a 3-week (six sessions twice a week) anxiety management training program. Following treatment, both groups were retested on all biomedical and psychological measures. Means and standard deviations for the hard-driving components of the JAS for the control and treated groups were calculated. Analysis of covariance showed a significant ($F = 4.77$; $p \leq .05$) reduction on hard driving scores for the treated individuals as compared to the control group. Although the ANCOVAs performed on speed and impatience and between groups pretest scores did not yield significant results, the between groups posttest scores were significant ($F = 4.45$, $p \leq .05$). Within-group differences were also found in the treatment group's pre-posttest median values on the JAS, and between-group post treatment STAI State ($F = 6.31$, $p \leq .05$) and Trait ($F = 5.37$, $p \leq .05$) scores. ANOVAs on systolic and diastolic blood pressure and cholesterol and triglyceride levels were not statistically significant. The authors did conclude that it was possible to alter several different aspects of Type A behavior patterns.

Another experiemntal study involving Type A managers was done by Roskies et al. (1979) to examine reliability and durability of positive treatment effects obtained in an intervention project. Thirty-one health professional and executive volunteers were randomly assigned into three groups: One group each was given 14 weekly sessions of psychotherapy, behavior therapy, or special behavior therapy, respectively. All three groups participated in pre and posttest sessions as well as a 6-month follow-up. However, 6-month follow-up only included 11 in the psychotherapy group, 10 in the behavior therapy group, and 5 in the special behavior therapy group. Physical examinations, measurements of blood pressure, JAS survey to ascertain pattern of behavior, and blood tests to evaluate lipid levels were used. To establish equivalence of groups prior to treatment, differences between means and frequencies on a number of psychological and physiological characteristics were compared using ANOVA and X^2 techniques. Statistical analysis included calculation of ANOVA for repeated measures to determine immediate effects of treatment in all three groups and to compare pre and posttreatment means. According to the authors, the Newman-Keuls post hoc test demonstrated that pre and post differences achieved statistical significance ($p \leq .05$) only

for two behavior groups: special behavior therapy group complied the best, the behavior group was second, and the psychotherapy group was last. Calculation of the Pearson correlation coefficients between pre and post differences in weight and serum cholesterol was $r = .12$ which was statistically significant. A three-way ANOVA for repeated measures was also computed 6 months after the end of treatment; all three groups maintained improvement.

Summary

The review of literature was categorized into five major topics: stress and health, occupational stress, personality characteristics, executive stress, and behavior modification. The two patterns of behavior, Type A and Type B, were discussed. Different interventions have been attempted for the purpose of changing Type A pattern of behavior in healthy persons. All interventions tended to produce some reduction in Type A behaviors although the level of change varied (Suinn, 1982). Anxiety management training was helpful in reducing the hard driving competitive and speed and impatience factors, while anxiety management training combined with psychotherapy has been shown to lead to significant reductions in perceived time urgency and pressure (Roskies et al., 1979; Suinn 1977). Other researchers (Girdano & Girdano, 1977; Yarian, 1976)

have utilized relaxation techniques which included EMG biofeedback, meditation, and progressive relaxation, and they reported positive results. Although these results are a start, the individual must accept his pattern of behavior and realize the need for change for any therapy to be effective. Once an individual's pattern of behavior is changed from Type A to Type B, new coping strategies will be formed and lifestyle changes will follow.

CHAPTER 3

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

In order to determine the relationship between levels of anxiety and patterns of behavior in executives, a descriptive, nonexperimental survey design was used (Polit & Hungler, 1978). This study involved the use of two questionnaires and a demographic data instrument. The dependent variable was level of anxiety, and the independent variable was pattern of behavior. Extraneous variables included age, sex, ethnicity, marital status, highest educational level, length of employment as an executive, and average hours worked per week in the position. The variable of age was controlled by including only those executives between the ages of 35 and 55 years in this study.

Setting

This study took place in a large city in southeast Texas with a population of more than 2 million. Executives from three large corporations were included. Questionnaire packets were distributed and collected in the workplace; no control was exerted over place of completion of the questionnaire.

Population and Sample

The population included 110 executives employed on a full-time basis in the selected oil corporations. Criteria for inclusion into the sample included the following: age 35 to 55 years, employed as an executive for more than 5 years on a full-time basis, and no prior diagnoses of stress-related illnesses. The sampling approach used was nonprobability, convenience sampling. Questionnaires were mailed to 70 executives; 52 were returned, and 22 of these respondents did not meet the criteria. Therefore, a sample of 30 executives was included in this study.

Protection of Human Subjects

Although this study was exempt from review by Texas Woman's University Human Subjects Review Committee because it was a questionnaire survey of adults, their guidelines were followed. Agency approvals were gathered from each of the five corporations selected for this study (Appendix A).

A cover letter accompanied each questionnaire packet (Appendix B). This cover letter introduced the investigator, explained the purpose of the study, and invited the subjects to participate. The cover letter also described anticipated risks, discomforts, or inconveniences involved in the study. Additionally, assurances of confidentiality and anonymity were offered, as well as answering questions

prospective subjects might have had about the study.

Finally, assurances were made that subjects had the right to refuse to participate without jeopardizing job security. A notation was made that subjects' completion and return of the questionnaire packet indicated their informed consent to participate. In the letter, subjects were asked to return the blank questionnaires if they choose not to participate. This would aid in follow-up if necessary. The letter directed the subjects not to place any names or identifying marks on the questionnaires to protect their anonymity.

To assure complete confidentiality and to facilitate follow-up if necessary, no names were used on the questionnaires or envelopes. Only the return envelopes carried code numbers. These numbers reflected the corporation, such as A for the first corporation, B for the second, and so forth, and a number arbitrarily assigned to the names of the executives as they appeared on lists or directories provided by the personnel departments, such as 01 for the first named executive. Thus, the first executive in the first corporation was assigned the number A-01. The master lists were kept confidential and in the possession of the investigator until data collection was completed. At that time, the lists were destroyed and results of the study were reported in group format only.

Instruments

Two tools and a demographic data sheet were used for this study (Appendix B). The Bortner Scale was selected to differentiate between Type A and Type B pattern of behavior, and permission was obtained for its use (Appendix C). Developed by Bortner (1969), this self-rating measure has 14 rating scales. Each scale is composed of two adjectives or phrases separated by a 1.5 inch line. Each pair represents contrasting behavior thought to reflect pattern A and pattern B behavior. Subjects are told to make a vertical line where they feel they belong on the line between the two extremes. The rating is scored by measuring to the nearest 16th of an inch from the beginning of the non-A end of the line to the point marked by the subject. The ratings are summed over the 14 items to obtain the self-rating score. Bortner used the average of his two group means, 196.5, as the cut-off between Type A and Type B.

Bortner (1969) utilized the self-rating scale in a study of 76 men using the interview method as a criterion measure. The difference between the self-ratings of the Type A and Type B men was statistically significant when compared with the classification by the interview method. A multiple regression analysis yielding beta weights was applied to the data from the aforementioned study in order

to determine the relative contribution of each item and the scoring direction. This was carried out on a reduced sample size ($n = 61$) in order to reduce the possibility of biased response from individuals who may have been familiar with the Type A pattern of behavior because they had clinical coronary heart disease. The Type A and Type B subjects were then classified on three versions of the scale with 64% to 75% correctly identified when using the interview as the criterion measure. Inter-item reliability of the 14-item scale was $r = .68$ (Bortner, 1969).

The tool utilized to measure anxiety levels of the Type A and Type B behavior groups was the State-Trait Anxiety Inventory (STAI), Form X-1. Developed by Spielberger, Gorsuch, and Lushene (1970), the STAI is a two-part, self-administered test entitled Self-Examination Questionnaire. Two distinct anxiety concepts are measured by the self-report scales--state anxiety (A-State), Form X-1, and trait anxiety (A-Trait), Form X-2. In this study, only state anxiety, Form X-1, was measured.

The state anxiety scale of the STAI consists of 20 statements with responses entered on a 4-point Likert-type scale (Spielberger et al., 1970). The STAI, Form X-1 instructs subjects to indicate how they feel at a particular moment. Scores for the STAI range from a minimum of 20

points to a maximum of 80 points on the A-State subscale. Should an individual omit one or two items, a protracted full-scale score can be obtained by (1) determining the mean score for the items responded to, (2) multiplying this value by 20, and (3) rounding the product to the next higher whole number.

Normative data for the STAI are available for large groups of college students, high school students, male psychiatric patients, general medical-surgical patients, and young prisoners (Spielberger et al., 1970). A study of 110 general medical-surgical patients without psychiatric complaints revealed a mean A-State score of 42.68, while the mean A-State score for 34 patients with psychiatric complaints was 42.35 (Spielberger et al., 1970).

Reliability of the tool was established using the test-retest correlations for the A-State scale in sampled undergraduate college students. During the test-retest interval the subjects were exposed to a brief period of relaxation training, a difficult intelligence quiz, and a film depicting accidents causing serious injury or death (Spielberger et al., 1970). The test-retest correlations for A-State scale varied from $r = .16$ to $r = .54$. The A-State low scores reflected the influence of the uniqueness of the situation existing at the testing time period. To

measure reliability of the more transitory anxiety states of the A-State scale, an alpha coefficient was computed for normative samples (Spielberger et al., 1970). The reliability of the A-State scale was $\underline{r} = .94$ when the scale was administered to college males immediately after a distressing film. Spielberger et al. stated that the A-State scale has a high degree of internal consistency.

Both concurrent and construct validity are important in determining value of instruments (Fox, 1973; Treece & Treece, 1973). Spielberger et al. (1970) reported concurrent validity on the STAI; moderately high correlations for both college students and patients with the IPAT Anxiety Scale and the Taylor Manifest Anxiety Scale were obtained. Construct validity was based on the findings of a sample of 977 undergraduate college students who took the A-State scale under normal and exam conditions. The A-State score means were higher in the exam conditions for the males, while all items were significantly higher in the female group (Spielberger et al., 1970).

The demographic data survey consisted of an assessment of each individual's age, sex, ethnicity, marital status, highest educational level, length of employment as an executive, and average hours worked per week in this position. This survey also assessed the individual's health

status by asking each respondent if they were currently or in the past had been treated for stress-related health problems, such as lung disorders, stomach ulcers, high blood pressure, heart disease, chronic headaches, neurological disorders, psychiatric disorders, stomach disorders, or substance abuse. Space was left for description of current health problems other than those listed previously.

Data Collection

Data collection took place over a 6-month period of time. A packet containing a cover letter, the Bortner Scale, the STAI, Form X-1, the demographic data sheet, and a self-addressed return envelope was sent by interoffice mail to each executive's office. Each return envelope bore a code number preceded by a letter designating the corporation. As the envelopes were retrieved, and prior to opening, numbers were crossed off corresponding lists by the investigator. No follow-up was necessary.

Each subject was asked in the cover letter to complete the questionnaires, seal in the self-addressed envelope, and return by interoffice mail as soon as possible to the personnel office. The investigator picked up the sealed envelopes at the end of one week. The executives were asked in the cover letter to return blank questionnaires if they

decided not to participate. No blank questionnaires were returned.

Treatment of Data

All data were coded using alphabetical letters. Frequencies and percentages were used to describe the sample. A chi-square was then computed to determine the relationship between pattern of behavior and demographic variables. A Mann-Whitney U and the Wilcoxin Rank Sum W Test were also calculated to determine a relationship between pattern of behavior and level of anxiety.

CHAPTER 4

ANALYSIS OF DATA

This descriptive, nonexperimental survey was conducted to determine if executives with Type A pattern of behavior have a higher level of anxiety than executives with Type B pattern of behavior prior to a diagnosis of stress-related illness. Those individuals with a diagnosis of stress-related illness were eliminated at the time of the study. Data were collected through the use of Spielberger's State-Trait Anxiety Inventory (STAI) and the Bortner Rating Scale. Data obtained from the STAI indicated levels of anxiety proneness. The Bortner Scale differentiated Type A pattern of behavior and Type B pattern of behavior. Demographic data regarding age, sex, race, marital status, level of education, number of years employed as an executive, and hours worked per week as an executive were collected by use of a demographic data questionnaire. Statistical analysis was achieved by calculation of the Mann-Whitney U test and the Wilcoxin Rank Sum W test to test the research question. The analysis of the data obtained is presented in this chapter.

Description of Sample

The sample consisted of 30 top level executives from three large corporations in a city in Southeast Texas with a population of more than 2 million. Thirteen participants with scores about 196.5 on the Bortner Rating Scale were designated as possessing Type A pattern of behavior, while 17 participants with scores below 196.5 were designated as possessing Type B pattern of behavior. The Type A group was composed of 9 (42.8%) males and 4 (44.4%) females, while the Type B group was composed of 12 (57.1%) males and 5 (55.5%) females. Computation of the chi-square showed no significant difference ($p \leq .05$) between the two groups in regards to sex.

Of the Type A participants, 11 (36.7%) were Caucasians and 2 (6.6%) were Blacks. The Type B group consisted of 15 (50.1%) Caucasians, 1 (3.3%) Black, and 1 (3.3%) Hispanic (Table 1). Computation of chi-square resulted in no significant differences ($p \leq .05$) between the two groups on ethnicity.

The ages of the two groups varied from 30 to 62 years with a mean age of 40.6 years. Those subjects with Type A pattern of behavior varied in age from 33 to 52 with a mean age of 40.6, while those participants with Type B pattern of behavior varied in age from 30 to 62 with a mean age of

40.6 years. The groups were equal. The largest percentage of subjects in each group were within the 40-44 age category; 4 (13.4%) were Type A and 5 (16.7%) were Type B individuals (Table 1). The standard deviation was 7.448, and the range was 32. The chi-square was 16.425 with degrees of freedom of 17. The significance level was 0.4939 which indicated no significant relationship was observed.

Marital status was also reported by the two groups. The majority (25; 83.4%) of the total sample were married (Table 1). Of the participants with Type A pattern of behavior, 11 (36.7%) were married. The largest number (14; 46.7%) of the participants with Type B pattern of behavior were also married. The mode for the total sample was married. The results were not statistically significant at $p \leq .05$.

The frequency distribution for the educational levels of participants from both Type A Group and Type B Group was also computed (Table 2). Thirteen (43.4%) of those participants designated with Type A pattern of behavior and 15 (50%) of those participants designated with Type B pattern of behavior had earned a bachelor's degree or higher.

All participants of this study were employed as top level executives. The number of years employed varied from 1 year to 35 years in the total sample with a mean of 8.03

Table 1

Frequency and Percentage Distribution of Race, Age,
and Marital Status of Executives by Type A and
Type B Groups and Total Sample

	<u>Type A Group</u>		<u>Type B Group</u>		<u>Total Sample</u>	
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
<u>Race</u>						
Caucasian	11	36.7	15	50.1	26	86.8
Black	2	6.6	1	3.3	3	9.9
Hispanic	<u>0</u>	<u>0.0</u>	<u>1</u>	<u>3.3</u>	<u>1</u>	<u>3.3</u>
Total	13	43.3	17	56.7	30	100.0
<u>Age</u>						
30-34	3	10.0	4	13.4	7	23.4
35-39	2	10.0	4	13.4	7	23.4
40-44	4	13.4	5	16.7	9	30.1
45-49	2	6.6	2	6.6	4	13.2
50-54	1	3.3	1	3.3	2	6.6
55-59	0	0.0	0	0.0	0	0.0
60-64	<u>0</u>	<u>0.0</u>	<u>1</u>	<u>3.3</u>	<u>1</u>	<u>3.3</u>
Total	13	43.3	17	56.7	30	100.0
<u>Marital Status</u>						
Single	0	0.0	3	10.0	3	10.0
Married	11	36.7	14	46.7	25	83.4
Divorced	1	3.3	0	0.0	1	3.3
Widowed	<u>1</u>	<u>3.3</u>	<u>0</u>	<u>0.0</u>	<u>1</u>	<u>3.3</u>
Total	13	43.3	17	56.7	30	100.0

years with a standard deviation of 7.170. Although the mean years of employment was 8.03, the majority (7; 23.5%) of the respondents with Type A pattern of behavior were in the 1-5 years category (Table 2). The Type B Group also had 7 (23.4%) executives in the 1-5 years category, but there were an additional 7 (23.4%) executives in the 6-10 years category.

The mean number of hours worked per week in the Type A group was 53.6, while the mean number of hours worked per week in the Type B Group was 48.9, which resulted in a total sample mean of 51 with a range of 58 and a standard deviation of 10.547. The largest number (6; 20%) of Type A Group participants reported working between 50 to 59 hours per week (Table 2). This category was also selected by the largest number (8; 26.7%) of the Type B group participants. No statistical significance was found which indicated there was no relationship between Type A pattern of behavior and the number of hours worked per week.

Findings

The research question asked in this study was: Do executives with Type A pattern of behavior have a higher level of anxiety than executives with Type B pattern of behavior prior to a diagnosis of stress-related illness? To answer this question, data were obtained through the use

Table 2

Frequency and Percentage Distribution of Education,
Years of Employment as an Executive, and Hours
Worked per Week as an Executive by Type A
and Type B Groups and Total Sample

	<u>Type A Group</u>		<u>Type B Group</u>		<u>Total Sample</u>	
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
<u>Highest Degree Held</u>						
Associate Degree	0	0.0	2	6.7	2	6.7
Bachelor's Degree	5	16.6	9	30.0	14	46.6
Master's Degree	6	20.0	3	10.0	9	30.0
Doctorate	<u>2</u>	<u>6.7</u>	<u>3</u>	<u>10.0</u>	<u>5</u>	<u>16.7</u>
Total	13	43.3	17	56.7	30	100.0
<u>Years of Employment as an Executive</u>						
1-5	7	23.5	7	23.4	14	46.9
6-10	2	6.6	7	23.4	9	30.0
11-15	2	6.6	1	3.3	3	9.9
16-20	2	6.6	1	3.3	3	9.9
21-25	0	0.0	0	0.0	0	0.0
26-30	0	0.0	0	0.0	0	0.0
31-35	<u>0</u>	<u>0.0</u>	<u>1</u>	<u>3.3</u>	<u>1</u>	<u>3.3</u>
Total	13	43.3	17	56.7	30	100.0
<u>Hours Worked Per Week as an Executive</u>						
Less than 40	0	0.0	1	3.3	1	3.3
40-49	3	10.0	5	16.7	8	26.7
50-59	6	20.0	8	26.7	14	46.7
60-69	3	10.0	2	6.7	5	16.7
70+	<u>1</u>	<u>3.3</u>	<u>1</u>	<u>3.3</u>	<u>2</u>	<u>6.6</u>
Total	13	43.3	17	56.7	30	100.0

of the State-Trait Anxiety Inventory (STAI)--Form X-1. This inventory was used to determine anxiety proneness of participants with Type A pattern of behavior as well as those with Type B pattern of behavior. Anxiety levels were measured only one time by each participant. The range of scores was 27 with a median score of 35. Comparison of scores between the two groups is shown in Table 3.

Table 3

Frequency and Percentage Distribution for Scores on
the STAI--Form X-1 by Type A and Type B Groups
and Total Sample

Score	Type A Group		Type B Group		Total Sample	
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
20-24	0	0.0	3	9.9	3	9.9
25-29	5	16.7	4	13.6	9	30.3
30-34	1	3.3	1	3.3	2	6.6
35-39	6	20.0	6	20.0	12	40.0
40-44	0	0.0	3	9.9	3	9.9
45-49	<u>1</u>	<u>3.3</u>	<u>0</u>	<u>0.0</u>	<u>1</u>	<u>3.3</u>
Total	13	43.3	17	56.7	30	100.0

A Mann-Whitney U test was calculated which indicated that those participants with Type A pattern of behavior had a mean rank of 15.46 and those participants with Type B pattern of behavior had a mean rank of 15.33. The result of comparing the two mean ranks was $\underline{U} = 110.0$. A Wilcoxin Rank Sum W test was also calculated and the result was $\underline{W} = 201$. Thus, results were not statistically significant at $p \leq .05$.

Summary of Findings

There was no significant difference found in anxiety levels between participants designated as possessing Type A pattern of behavior and those possessing Type B pattern of behavior with regard to sex, age, marital status, level of education, number of hours worked per week, or years employed as an executive. Additionally, there was also no significant difference ($p \leq .05$) found in levels of anxiety between executives with Type A pattern of behavior and those with Type B pattern of behavior when statistically treated with the Mann-Whitney U test and the Wilcoxin Rank Sum W test.

CHAPTER 5

SUMMARY OF THE STUDY

To determine if executives with Type A pattern of behavior had higher levels of anxiety than executives with Type B pattern of behavior, a nonexperimental, descriptive survey was conducted. Only those executives free of a diagnosis of stress-related illness were included in the sample.

Summary

A convenience sample of 30 executives participated in this study. The sample was drawn from three corporations in a large metropolitan area in southeast Texas with a population of more than 2 million. A demographic data sheet was completed by the sample. These data provided the sample's sex, ages, marital status, level of education, years employed as an executive, and number of hours worked per week. The Bortner Rating Scale was utilized to differentiate between Type A and Type B pattern of behavior in the 30 executives. Scores above 196.5 were obtained by 13 (43.3%) of the participants which classified them as having Type A pattern of behavior; 17 (56.7%) of the

executives obtained scores below 196.5 and were designated as having Type B pattern of behavior.

The Type A Group in this study was composed of 9 (30.0%) males and 4 (13.4%) females. The Type B Group had 12 (39.9%) males and 5 (16.7%) females. The majority of the sample (26; 86.8%) were Caucasian, most (23; 76.9%) were 30 to 44 years of age, and most (25; 83.4%) were married. All but two (6.7%) of the total sample had bachelor's degrees or higher and the majority (23; 76.9%) had spent from 1 to 10 years as an executive. Almost half (14; 46.7%) of these executives worked from 50 to 59 hours per week.

The Spielberger State-Trait Anxiety Inventory (STAI)--Form X-1 was utilized to determine the levels of anxiety in the sample of executives. Scores from the two groups, Type A Group and Type B Group, were ranked using the Mann-Whitney U to determine if a difference existed between the groups. Additionally, a Wilcoxin Rank Sum W was calculated to determine significance. Results were not significant at $p \leq .05$.

Discussion of Findings

Although authors (Howard, Cunningham, & Rechnitzer, 1976; Keith, Lown, & Stare, 1965) in the literature reviewed indicated a relationship between age, sex, educational level, and Type A pattern of behavior, findings in this

study did not support a relationship. Also, according to the authors (Howard et al., 1976; Keith et al., 1965), Type A pattern of behavior is associated with those who are highly educated, males, and those who are older. Again, the findings of this study did not indicate that this occurred in this sample of top level executives.

The occupational demographic data collected in this study revealed a broad range in terms of number of hours worked per week and years employed as an executive. Those with Pattern A behavior characteristically worked longer hours than did those with Pattern B behavior, but in this study no statistically significant ($p \leq .05$) relationship was found. Although researchers (French & Caplan, 1970; French, Tupper, & Mueller, 1965; Friedman, 1969; Glass, 1977; Kahn, 1973; Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964) have identified those individuals with Type A pattern of behavior with work overload and long hours worked, these relationships were not supported in this study.

Scores from the STAI--Form X-1 which was administered to each participant in this study showed no significant ($p \leq .05$) difference between Type A Group and Type B Group. Although the best tool for differentiation of behavior patterns is the Jenkins Activity Survey, it is not available for general clinical use. The Bortner Scale, however,

provides a "crude index of Pattern A behavior" (Bortner, 1969, p. 87) and was used in this study. For this reason, the estimation of behavior pattern in this study may not be a totally accurate reflection of Type A and Type B patterns of behavior.

The literature has indicated that executives are in fact at risk due to the tremendous amount of pressure and change the economy has undergone in the past 20 years. Researchers (Cooper, 1977; Cooper & Payne, 1976; Matteson & Ivancevich, 1980) have also indicated that perhaps top level managers are at less risk to develop stress-related illnesses because they delegate a large amount of their workload to the second level managers. This study was confined to top level managers and no relationship was found to exist between pattern of behavior and level of anxiety among the healthy executives tested.

Conclusions and Implications

From the findings of the study, the following conclusions were drawn:

1. There was no significant relationship found between the demographic variables of age, sex, marital status, educational level, and ethnic group and pattern of behavior.

2. Type A pattern of behavior did not correlate significantly with a higher level of anxiety.
3. The number of hours worked did not correlate with pattern of behavior or an increased level of anxiety.

Although this study implied that there was no significant relationship between extraneous variables, pattern of behavior and level of anxiety, this does not indicate it is true in all samples. Lack of accessibility of instrumentation or limited sample size which did not generate significant data may have contributed to the findings of this study.

Recommendations for Further Study

Based on the findings of this study, the following recommendations are offered:

1. This study design should be replicated utilizing a larger sample and the Jenkins Activity Survey for a more accurate determination of pattern of behavior in executives.
2. This study should also be replicated, but the second level managers should be added to the sample.
3. A study based on this study design should be undertaken with equal female and male distribution.
4. If a significant relationship is found in a replication study, a study should then be conducted which measures

compliance of an anxiety management training program in executives with Type A pattern of behavior one year after the intervention has been applied.

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APPENDIX A
AGENCY APPROVALS

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING
DENTON, TEXAS 76204

DALLAS CENTER
1810 INWOOD ROAD
DALLAS, TEXAS 75235

HOUSTON CENTER
1130 M. D. ANDERSON BLVD.
HOUSTON, TEXAS 77030

AGENCY PERMISSION FOR CONDUCTING STUDY*

THE

GRANTS TO Sue Tanner, Texas Women's University,
a student enrolled in a program of nursing leading to a Master's Degree at Texas
Woman's University, the privilege of its facilities in order to study the follow-
ing problem:

RELATIONSHIP BETWEEN PATTERNS OF BEHAVIOR AND LEVELS
OF ANXIETY IN EXECUTIVES

The conditions mutually agreed upon are as follows:

1. The agency (may) (~~may not~~) be identified in the final report.
2. The names of consultative or administrative personnel in the agency
(~~may~~) (may not) be identified in the final report.
3. The agency (wants) (~~does not want~~) a conference with the student
when the report is completed.
4. The agency is (willing) (~~unwilling~~) to allow the completed report
to be circulated through interlibrary loan.
5. Other _____

Date: May 14, 1985

Donald U. Vincent
Signature of Agency Personnel
Donald U. Vincent, Asst. to the GM/Personnel

Signature of Student

Signature of Faculty Advisor

* Fill out and sign three copies to be distributed as follows: Original-Student;
First copy - agency; Second copy - TWU College of Nursing.

abc

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING
DENTON, TEXAS 76204

DALLAS CENTER
1310 INWOOD ROAD
DALLAS, TEXAS 75235

HOUSTON CENTER
1130 M. D. ANDERSON BLVD.
HOUSTON, TEXAS 77030

AGENCY PERMISSION FOR CONDUCTING STUDY*

THE _____

GRANTS TO the Texas Woman's University
a student enrolled in a program of nursing leading to a Master's Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem:

Continuity Between Patterns of Behavior
and Level of Anxiety in Executive

The conditions mutually agreed upon are as follows:

1. The agency (~~may~~) (may not) be identified in the final report.
2. The names of consultative or administrative personnel in the agency (~~may~~) (may not) be identified in the final report.
3. The agency (~~wants~~) (does not want) a conference with the student when the report is completed.
4. The agency is (willing) (~~unwilling~~) to allow the completed report to be circulated through interlibrary loan.
5. Other _____

Date: May 12, 1968

[Signature]
Signature of Agency Personnel

[Signature]
Signature of Student

[Signature]
Signature of Faculty Advisor

* Fill out and sign three copies to be distributed as follows: Original-Student;
First copy - agency; Second copy - TWU College of Nursing.

/bc

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING
DENTON, TEXAS 76204

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1810 INWOOD ROAD
DALLAS, TEXAS 75235

HOUSTON CENTER
1130 M. D. ANDERSON BLVD.
HOUSTON, TEXAS 77030

AGENCY PERMISSION FOR CONDUCTING STUDY*

THE _____

GRANTS TO For - Turner, Texas Woman's University
a student enrolled in a program of nursing leading to a Master's Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem: Relationship Between Patterns of Behavior and
Level of Anxiety in Executives

The conditions mutually agreed upon are as follows:

1. The agency (~~may~~) (may not) be identified in the final report.
2. The names of consultative or administrative personnel in the agency (~~may~~) (may not) be identified in the final report.
3. The agency (~~wants~~) (does not want) a conference with the student when the report is completed.
4. The agency is (willing) (~~unwilling~~) to allow the completed report to be circulated through interlibrary loan.
5. Other _____

Date: 6-15-60

T. J. Turner
Signature of Agency Personnel

T. J. Turner
Signature of Student

T. J. Turner
Signature of Faculty Advisor

* Fill out and sign three copies to be distributed as follows: Original-Student;
First copy - agency; Second copy - TWU College of Nursing.

abc

APPENDIX B
QUESTIONNAIRE PACKET

SELF-EVALUATION QUESTIONNAIRE

STAI FORM X-1

This instrument is the state-anxiety form of the State-Trait Anxiety Inventory (STAI) developed by C. D. Spielberger, R. L. Gorsuch, and R. Lushene. This questionnaire contains 20 statements, such as "I feel calm," with 4-point Likert-type scale responses varying from "Not at all" to "Very Much So." This questionnaire is copyrighted and is for sale from the following company:

Consulting Psychologists Press

577 College Avenue

Palo Alto, CA 94306

The Bortner Scale

Self Rating Scale

Directions: Each of us belongs somewhere along the line between these two extremes. For example, most of us are neither the most competitive nor the least competitive person we know. Please make a vertical line where you think you usually belong between these two extremes.

Never Late	_____	Casual about appointments
Not competitive	_____	Very competitive
Anticipates what others are going to say (nods interrupts, finishes for them)	_____	Good listener, hears others out
Always rushed	_____	Never feels rushed, even under pressure.
Can wait patiently	_____	Impatient when waiting
Goes "all out"	_____	Casual
Takes things one at a time	_____	Tries to do many things at once, thinks about what he's going to do next
Emphatic in speech (may pound desk)	_____	Slow, deliberate talker
Wants good job recognized by others	_____	Only cares about satisfying himself no matter what others may think
Fast (eating, walking, etc.)	_____	Slow doing things
Easy going	_____	Hard driving
"Sits" on feelings	_____	Expresses feelings
Many interests	_____	Few interests outside of work
Satisfied with job	_____	Ambitious

8. Health History:

Have you ever, or are you now being treated for any of the conditions listed below? If answer is yes, please explain.

	<u>Yes</u>	<u>No</u>
a. Lung disorder	___	___
b. Stomach ulcers	___	___
c. High blood pressure	___	___
d. Heart disease	___	___
e. Chronic headaches	___	___
f. Neurological disorders	___	___
g. Psychiatric disorders	___	___
h. Stomach disorders	___	___
i. Substance abuse	___	___

9. Are you presently under the care of a physician for any other reason than those listed above?

___ a. No

___ b. Yes (please explain) _____

THANK YOU for your time and cooperation!

DEMOGRAPHIC DATA SHEET

Please fill in the blank or place a ✓ in the appropriate space for each question.

1. Age _____
2. Sex
 ___ a. Male
 ___ b. Female
3. Ethnicity
 ___ a. Caucasian
 ___ b. Black
 ___ c. Oriental
 ___ d. Hispanic
 ___ e. Other (please specify) _____
4. Marital Status
 ___ a. Single
 ___ b. Married
 ___ c. Separated
 ___ d. Divorced
 ___ e. Widowed
5. Highest Educational Level
 ___ a. High School Diploma
 ___ b. Associate Degree
 ___ c. Bachelor's Degree
 ___ d. Master's Degree
 ___ e. Doctor's Degree
 ___ f. Other (please specify) _____
6. Length of Employment as an Executive _____
7. Average Hours Worked per Week in this Position _____

APPENDIX C
AUTHOR'S PERMISSIONS

12345 Bob White #1606
Houston, Texas 77035
2/29/84

Mrs. Bortner
P.O. Box 231
Gales Ferry, Connecticut 06335

Mrs. Bortner:

I am a Graduate Student in Nursing at Texas Woman's University in Houston, Texas. I am presently working on my thesis which will involve anxiety levels, and pattern of behavior in executives prior to diagnosis of any stress-related disease. I am very interested in using the Bortner Rating Scale as the tool to assess pattern of behavior and have been referred to you by The Pennsylvania State University. Copy of my results will be available to you, if desired.

Thank you,

Sue M. Tanner

Sue M. Tanner

*Dear Miss Tanner
Thank you for asking.
I'd find to use the Rating scale.
Dorothy M. Bortner*