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An Analysis of the Correlation between Coping Factors and Clinical Symptoms

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AN ANALYSIS OF THE CORRELATION BETWEEN COPING FACTORS AND CLINICAL SYMPTOMS

by

Justin Morgan Wilson

A Dissertation
Submitted to the
Faculty of The Graduate College
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AN ANALYSIS OF THE CORRELATION BETWEEN COPING FACTORS AND CLINICAL SYMPTOMS

Justin Morgan Wilson, Ed.D.
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The purpose of this study was to investigate the relationship between coping skills and clinical symptoms in the context of a stressful situation. The study gave support to Lazarus' cognitive model of stress. This conceptualization of stress is based on the dynamic relationship between intertwining variables.

The sample consisted of 336 male recruits ranging in age from 17-34 who were beginning basic training on March 11 and 12, 1986. Coping style was measured by the Ways of Coping Checklist Revised and clinical symptoms were measured by the Cornell Medical Index Health Questionnaire. Both questionnaires were given on the second day of training and again eighteen days later.

There was no significant difference (P < .05) in the total number of clinical symptoms reported by naval recruits as measured by the Cornell Medical Index Health Questionnaire between the initial testing and the second testing. However, the marginal mean of clinical symptoms for naval recruits was 15.26 in comparison to the mean of 8.69 for a healthy group of individuals not experiencing
a particular stressor. This suggested that naval basic training was a stressful situation.

A significant difference (P < .05) was detected between coping factors on testing one and testing two which supports Lazarus and Folkman's theoretical tenet that coping style can be conceptualized as a "state" rather than a "trait." Finally, a positive correlation accounting for 17% of the variance was found between coping factors on testing one and clinical symptoms on testing two. This significant correlation (P < .05) between coping factors and clinical symptoms supported the relationship conceptualized by Lazarus et al. between mediating processes and immediate effects. While this study supported theoretical tenets of Lazarus' model of stress, the Ways of Coping Checklist Revised was not an adequate predictor of clinical symptoms as measured by the Cornell Medical Index Health Questionnaire given the low variance accounted for by the Ways of Coping Checklist Revised.
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I would like to dedicate this dissertation to my loving wife, Carolyn, and our daughter, Morgan. This dissertation would not have been accomplished without my wife's continued support, motivation, and time given to typographic assistance.

I would also like to express deep appreciation to my dissertation committee, consultants, and friends who were involved in the preparation of this dissertation.

Justin Morgan Wilson
# TABLE OF CONTENTS

**ACKNOWLEDGEMENTS** .............................................. ii  
**LIST OF TABLES** ................................................ vi  

## CHAPTER

### I. INTRODUCTION  .......................................................... 1  
  Background of the Problem .................................. 1  
  Statement of the Problem ................................ 13  
  Significance of the Study ................................ 13  
  Research Objectives ........................................ 15  
  Limitations ................................................ 15  
  Overview of the Study ........................................ 16  

### II. REVIEW OF SELECTED LITERATURE  ..................... 18  
  The Psychosomatic Perspective .............................. 18  
    Definitions .............................................. 18  
    Historical Precursors .................................. 20  
    Psychoanalytic Influence on  
       Psychosomatic Medicine ................................ 22  
  Stress Defined as a Response ............................... 29  
    Behavioral Response .................................... 29  
    Classical Conditioning ................................ 29  
    Operant Conditioning ................................... 31  
    Physiological Response ................................ 33  
  Stress Defined as a Stimulus ............................... 36  
  Stress Defined as a Mediating Process .................... 40  
  Summary ...................................................... 49  

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Table of Contents - Continued

CHAPTER

III. METHOD .................................... 51
   Population and Sample ..................... 51
      Population ................................ 51
      Sample .................................. 52
   Diagnostic Conditions ..................... 54
      Clinical Symptoms ....................... 54
      Coping Style ............................ 55
   Criteria Instruments ....................... 55
      Cornell Medical Index Health Questionnaire (CMI) .............................. 55
      Ways of Coping Checklist Revised (WCCL) ............................ 56
   Procedures .................................. 57
   Statistical Hypotheses .................... 59
      Hypothesis One ........................... 59
      Hypothesis Two ........................... 59
      Hypothesis Three .......................... 60
   Statistical Analysis ....................... 60

IV. RESULTS .................................... 62
   Data and Their Analyses .................... 62
      Statistical Hypotheses ................... 62
         Hypothesis One .......................... 64
         Hypothesis Two .......................... 65
         Hypothesis Three ........................ 66
Table of Contents- Continued

CHAPTER

Additional Analysis ......................... 69
Discussion ..................................... 71
V. SUMMARY AND RECOMMENDATIONS ............ 80
   Summary ..................................... 80
   Recommendations ............................ 83

REFERENCES .................................. 85

APPENDICES .................................. 94
   A. Cornell Medical Index Health Questionnaire ... 95
   B. Ways of Coping Checklist Revised ............... 100
   C. Revised Ways of Coping Checklist Factors ....... 105
   D. Voluntary Consent Form ..................... 107
   E. Privacy Act Statement ...................... 110

BIBLIOGRAPHY ................................. 112
LIST OF TABLES

1. A Comparison of Mean and Standard Deviations for Total CMI Scores and Factors of the WCCL Revised for Testing One and Two .................................................. 63

2. An Analysis of Variance With Repeated Measures of CMI Total Score Between CMI Testing One and Two ................................................................. 64

3. Analysis of Variance for Repeated Measures of the WCCL Revised Factors Between Testing One and Two ....................................................... 65

4. Pearson-Product Correlation Coefficients Between the WCCL Revised Factor Scores Testing One and CMI Total Scores on Testing Two ......................... 67

5. Summary of the Stepwise Regression Steps Between Coping Factors Testing One and Total CMI Score Testing Two .......................................................... 69

6. Analysis of Variance for Dependent Measures of CMI Total Score Between Transferred and Non-Transferred Subjects ........................................ 71
CHAPTER I

INTRODUCTION

Background of the Problem

In today's society, the concept of stress and its intertwining dynamics have received a considerable amount of attention and interest. People desire to cope more effectively in today's fast paced, technological society. While the study and interest in stress are now "vogue," man has struggled with stress for centuries. Historical accounts of man's struggle with stress are seen in his being thrown out of the Garden of Eden, dealing with the Black Plague of the Middle Ages, and coping with World Wars I and II. On a more individual basis, man has dealt with stress associated with hunger; facing the elements, and obstacles from dinosaurs to modern day strikes.

The individual constructs that make up the global picture of stress have been studied and debated for centuries. Socrates, in Plato's Republic (cited in Smith, 1968), described the conflict one has when deciding between desire and reason. Aristotle in de Anima (cited in Smith, 1968), described the internal conflict between one's desire for immediate gratification versus delayed gratification. Theologians have described
the spiritual stress one experiences when struggling with the desire for worldly pleasures versus closeness with God. Since the late 19th century, the focus has shifted towards a scientific study of the factors involved with stress. The scientific study of stress has been divided into three different fields of scientific inquiry. Each field of scientific inquiry has a different conceptual apex from which to study stress. The three conceptual foci are personality style, response or stimuli, and a mediating process.

Historically, the field of psychosomatic medicine has struggled to conceptualize how the psyche and soma responded to stress. This trend in the early 1900s was an attempt by the psychoanalytic theorists to describe the specific pathways and personality style between psyche and soma in reaction to stress. This early trend was plagued by lack of validation and an over simplistic conceptualization of how the psyche and soma respond to stress.

A second trend in psychosomatic medicine developed which focused on investigating what happens to a person in a nonspecific way when faced with stress rather than attempting to define specific pathways. This second trend resulted in defining stress as a response or as a stimulus. In defining stress as a response, the historical focus has been on the behavioral and
physiological responses. In defining stress as a stimulus, the historical focus has centered on the environment and life stressors.

A third trend in research on the stress paradigm progressed from looking at one variable, for example, personality style or response/stimuli, to examining a mediating process which involves multiple factors. This third trend in research and the ensuing study is heavily based on Lazarus' (1966) cognitive perspective of stress. In a recent article in the American Psychologist, Lazarus, DeLongis, Folkman, and Gruen (1985) denote that stress involves a complex rubric consisting of interrelated variables and processes rather than a simple variable that can account for the variance of long term effects, for example, somatic illness.

Folkman (1984) described how this cognitive theory of stress is distinguished from the other two trends in stress research and concisely described the cognitive perspective in the following:

The cognitive theory of stress and coping on which this discussion is based is relational and process oriented. The relational characteristic is evident in the definition of stress as a relationship between the person and the environment that is taxing or exceeding his or her resources and as endangering his or her well-being. This relational definition distinguishes this theory from those approaches in which stress is defined as a stimulus (i.e., a stressor), such as an exam, a shock, or a noxious medical procedure; as a product of intrapsychic conflict centering on the person's needs, motives, impulses, or beliefs; or as a response, such as physiological
arousal, or subjective distress. In the definition offered here, stress is not a property of the person or the environment, nor is it a stimulus or a response. Stress is a particular relationship between the person and the environment. ... Process oriented has two meanings in the relation to the cognitive theory of stress: first, that the person and the environment are in a dynamic relationship that is constantly changing and, second, that this relationship is bidirectional, with the person and the environment each acting on the other. (p. 840)

The two most important constructs in this process-oriented theory of stress are appraisal and coping. Appraisal is then broken down into two parts, primary and secondary. Primary appraisal entails evaluation of the situation with respect to its significance to one's well-being in terms of harm/loss, threat or challenge. The primary appraisal is shaped by the beliefs and commitments of the person, situational factors which include the familiarity of the event, likelihood of occurrence, and clarity of outcome. Secondary appraisal includes evaluation of coping resources and options which include physical, social, psychological, and material assets available to the individual in relationship to the demands of the situation.

The second major variable in this cognitive theory of stress is coping. Coping follows secondary appraisal and takes two forms, emotion-focused or problem-focused. Coping involves cognitive and behavioral efforts to manage the situation. The regulation of emotions or
distress involves emotion-focused strategies while management of the problem causing stress involves problem-focused strategies.

Folkman and Lazarus (1980) analyzed the ways one hundred urban residents, ages ranging from 45 - 64, coped with the stressful situations of daily living during a one year period. This study was based on the theoretical framework of Lazarus' (1966) cognitive-phenomenological analysis of psychological stress. Folkman and Lazarus devised the "Ways of Coping Checklist" (WCCL) to measure how their subjects coped with the stressful situations of daily living. Results of the study supported three of the major theoretical tenets underlying Lazarus' model. The first tenet upheld was that coping involved both problem-focused and emotion-focused functions. Less than two percent of the 1,332 stressful episodes analyzed were found to use only one type of coping. The second major theoretical tenet involved consistency of coping patterns between person and environment. The consistency of scores over the variety of situations showed that neither person factors or situation factors alone determined the coping style. The third theoretical framework supported by this study involved the relationship between context, appraisal and coping. Context and how the event was appraised were the most important variables in determining how the individual would cope with the
situation. Folkman and Lazarus (1980) stated:

Work contexts favor problem-focused coping, and health contexts favor emotion-focused coping. Situations in which the person thinks something constructive can be done or that are appraised as requiring more information favor problem-focused coping, whereas, those having to be accepted favor emotion-focused coping. (p. 219)

Over the past several years various researchers have begun to look at the theoretical tenets involved in Lazarus' cognitive-phenomenological analysis of psychological stress. Harris and Landreth (1981) designed a study based on this model to look at the cognitive mediating processes involved in the stress-illness relationship. They evaluated the effects of several moderating variables in addition to external stress in 188 college students as measured by the Schedule of Recent Experiences (SRE) developed by Holmes and Rahe (1967) in relationship to illness. Illness was measured by the Seriousness of Illness Rating Scale (SIRS) developed by Wyler, Masuda, and Holmes (1968). Results indicated trait anxiety accounted for 21% of the variance in relationship to illness. In comparison, external stress accounted for only six percent of the variance in relationship to illness.

Matheney and Cupp (1983) examined the relationship between appraisal and illness. In their study, they looked at the cognitive processes of perceived control, desirability, and anticipation of life events in 126
subjects in relationship to physical illness as measured by the SIRS. Their findings supported the hypothesis that events beyond one's control, perception of events as undesirable, and failure to anticipate life events were associated with illness to a significant degree. These events were positively related to illness as well as the fact that the inverse of these moderating variables would not produce illness. Perceived control emerged as the variable that accounted for the greatest amount of variance in relationship to illness as measured by the SIRS.

The theoretical or conceptual tenet of the relationship between how one appraises a situation and how one copes with it has been studied by McKay (1984). This study looked at the relationship between coping mechanisms and appraisal of the situation as a loss, threat or challenge. He found that the type of stressor had a significant effect on the choice of coping mechanisms. If an individual perceived a situation as a loss, he was more likely to use faith, fatalism, or expression of feelings as a coping device, whereas, if a situation was appraised as a condition for challenge, a number of mechanisms were used such as rational action, perseverance, and positive thinking. This study also supported the work of Billings and Moos (1984) who found
rational problem-focused actions being used more with threat than harm/loss.

Billings and Moos (1984) examined the relationship between coping responses and severity of dysfunction, as measured by 424 subjects diagnosed with unipolar depression. They found that coping responses directed toward problem solving and affect regulation were associated with less severe dysfunction, whereas emotion discharged responses were associated with greater dysfunction. In addition, moderating variables which include stressors, social resources, and coping were additively predictive of a patient's function but showed no interactive effects.

A recent study by Vitaliano, Russo, Carr, Maiuro, and Becker (1985) has examined the psychometric properties of the Ways of Coping Checklist (WCCL) originally derived by Folkman and Lazarus (1980). This study compared the original seven factored scales derived by Aldwin, Folkman, Schaefer, Coyne, and Lazarus (1980) (cited in Vitaliano et al., 1985). Vitaliano et al, (1985) examined the factor structure of the original scales, internal consistencies, reliabilities, inter-correlations of original and revised scales, the construct and concurrent validity of the revised scales, and their relationship to demographic factors. These properties were examined on three distressed samples.
which consisted of: 83 psychiatric outpatients, 62 spouses of patients with Alzheimer's disease, and 425 medical students. The study found the revised scales consistently more reliable and shared consistently less variance than the original scales across all samples.

The revised instrument contained 46 items rather than the original 68 items. Each item had a factor loading of .35 or greater and analysis resulted in five factors. The factors consisted of Problem-Focused and four Emotion-Focused coping factors which were Seeks Social Support, Blamed Self, Wishful Thinking, and Avoidance. The scale also contained the original four items used to measure appraisal from the WCCL. The four items read, "In general, is the situation one: (1) that you could change (changeable) or do something about?; (2) that must be accepted or gotten used to?; (3) that you needed to know more about before you could act; (4) in which you had to hold youself back from doing what you wanted to do?" (Vitaliano et al., 1985, p. 19).

Regarding construct validity, the revised Wishful Thinking scale was positively related to depression and negatively related to the revised Problem-Focused scale in cross samples. Anxiety was also related to these scales in a similiar way. The Seeks Social Support scale was positively related to anxiety across samples. These findings are consistent with those found by Billings and
Moos (1984). Evidence for concurrent validity was obtained by comparing medical students participating in group therapy with medical students not in group therapy. They found group members to have significantly higher scores on the revised Wishful Thinking and Seeks Social Support scales. This study lent empirical support to the theoretical tenet of the relationship between appraisal and coping. This study also found that appraisal for changeable and needing to know more were done by subjects who were problem-focused while acceptance and holding oneself back yielded significantly more emotion-focused coping.

The above mentioned research has given empirical support to Lazarus' cognitive-phenomenological analysis of psychological stress. The research suggests a dynamic relationship between personal and environmental variables, mediating processes involving appraisal and coping, and the effects. The effects as described by Lazarus (Lazarus et al., 1985) can be broken down into immediate and long term effects. The immediate effects include affect, physiological changes, and quality of the encounter outcome. The long term effects are psychological well-being, somatic health/illness, and social functioning. Considering the neophyte stage of this research, coping style in relationship to stress as
measured by one's psychosomatic state has not been examined yet.

A measurement used over the past 35 years that examines one's overall health index is the Cornell Medical Index Health Questionnaire (CMI). The CMI "was devised to meet the need for an instrument suitable for collecting a large body of pertinent medical and psychiatric data at a minimal expenditure of the physician's time" (Brodman, Erdmann, Jr., & Wolff, 1949). Levitt (1972), as well as Lyken (1972), in the Seventh Mental Measurement Yearbook, called the CMI questionable as a general psychiatric evaluation instrument. However, Levitt (1972) states that "the CMI is face valid as a symptom checklist" (p. 125).

Cheraskin and Ringsdorf (1973) utilized the CMI in their studies of dentists as a normal subject group. They found relationships between numbers of symptoms, diseases, life styles, as well as dental caries. For example, they found that blood pressure, serum lipids, uric acid, diet, tobacco consumption, physical activity, blood glucose, number of clinical symptoms, weight and cavities were all interrelated.

Rahe, Biersner, Ryman and Arthur (1972) found the number of "yes" answers on the CMI were predictors of dispensary visits by United States Navy enlisted men in Underwater Demolitions Team training. They also found
the CMI correlated significantly with failure to complete training in this most stressful of training regimes.

Since 1970, the CMI has been routinely included in the screening battery for the military personnel and civilians who apply to spend some time at one of the research stations at the Antarctic (Seymour, 1976). Seymour (1976) used the opportunity of this large sample of normal subjects to assess the predictive ability of the CMI, as well as to gather some normative data. The problem that he encountered was that the population of volunteers was highly homogenous and at the same time very healthy with relatively few symptoms. The mean number of "yes" responses was 8.69 (Seymour, 1976).

Bory (1983) examined the relationship between one's personality as measured by the Minnesota Multiphasic Personality Inventory (MMPI), (Hathaway & McKinley, 1967) and one's general health as measured by the CMI. He found the MMPI to be positively correlated with the CMI suggesting that elevation of the MMPI scales may indicate an accompanying elevation in the number of clinical symptoms. While Bory (1983) found a positive relationship between personality profile and health, a more significant relationship may exist between how one copes with a specific stressful situation and one's overall health.
Statement of the Problem

Research dealing with Lazarus' cognitive-phenomenological analysis of psychological stress has shown an existing relationship between appraisal and coping as well as coping and one's affective state. However, research has yet to examine the relationship between immediate effects involving affect and physiologic changes that occur in response to a specific stress and how one copes with it. This study will investigate the relationship between coping and short term affect and physiological changes as they occur in a specific stressful situation. This study will examine if one's style of coping is predictive of the short term effects of affect and physiological changes as they occur in response to a specific situation.

Significance of the Study

The study has relevance to both theory and practice. In regards to theory, this study will test the theoretical tenet that coping mechanisms are dynamically related to immediate effects of affect and physiological changes when one attempts to cope with a stressful situation. The establishment of a better understanding of this relationship may aid in the refinement of the framework on which Lazarus' cognitive-phenomenological model of psychological stress is based and hopefully
stimulate further inquiry about the relationship of coping style to clinical symptoms. There is broad agreement among investigators that a relationship exists between appraisal and coping as well as coping and one's affective state. However, the nature of this relationship between one's coping and the immediate effects of a stressful situation, affect and physiological changes remains controversial. The establishment of a better understanding of this relationship will be valuable in predicting the number of clinical symptoms an individual will exhibit in a stressful situation from knowledge of the coping style utilized.

Since this study's population will consist of U.S. Navy recruits, it may be of practical value to the U.S. Navy. Biersner, LaRocco, and Ryman (1976) report that scarce administrative and medical resources are consumed by frequent sick call visits to the dispensary and failure to complete military training. Since the CMI has been found to be predictive of those navy recruits who make frequent dispensary visits and fail to complete training (Rahe et al., 1972), an inventory which has predictive value in measuring the clinical symptoms on the CMI would have practical value. It could be used as a screening device to assess those individuals who are likely to fail basic training and/or be costly to the
navy by making frequent sick call visits to the dispensary. These individuals could be disenrolled from the navy prior to initiation or be given additional training. This study will accomplish this by examining if one's coping style is predictive of clinical symptoms as measured by CMI.

Research Objectives

The research objectives of this study are to investigate the extent to which individuals respond to a stressful situation by exhibiting immediate effects by changes in their clinical symptoms, and to investigate the feasibility of predicting the number of clinical symptoms an individual will exhibit from knowledge of the coping style used in the stressful situation. The consistency of one's coping style will also be investigated. This study assumes that the existence of a relationship between coping styles and clinical symptoms will have important implications for understanding one's response to stressful situations.

Limitations

Subjects for this study will be male individuals entering naval recruit training at Great Lakes Recruit Training Command, Great Lakes, Illinois, in March and April, 1986. It is, therefore, not a random selection of
all naval recruits and generalizations to other populations may be limited. The pattern of clinical symptoms displayed may also be effected by other factors such as recent exposure to other psychosocial stressors prior to the beginning of or during naval recruit training. Also, subjects will be volunteers which could be a source of bias since data will not be available from those naval recruits who refuse to participate in this study. The procedures of the navy could further complicate the project by releasing or terminating the training of certain recruits before completion of the study.

This study will be limited in comparability to the extent that the instruments used were not necessarily compatible with others that are used by psychologists in a stressful situation.

Overview of the Study

The preceding chapter has examined Lazarus' cognitive-phenomenological model of stress and the theoretical tenets that have been examined by research. Since there is a paucity of data dealing with these theoretical tenets, there are still tenets to be validated. The main purpose of this study will be to examine the predictiveness of coping style in relationship to clinical symptoms. The next chapter will
review the literature related to stress and psychosomatic illness. Chapter three will define the design and methodology of the study. Chapter four will give the results of the study. The final chapter will provide recommendations for further research.
CHAPTER II

REVIEW OF SELECTED LITERATURE

The Psychosomatic Perspective

Definitions

Prior to undertaking a review of the major theories of psychosomatic disorders, one must understand the common conceptual problems and issues that face this field and have frustrated efforts to build and evaluate a comprehensive theory. The major concern is stated by Reiser (1975) in the following statement:

Regardless of our ultimate conviction that mind and body constitute a true functional unity, the fact remains that as observers, investigators, and theorists, we are obliged (whether we like it or not) to deal with data from two separate realms, one pertaining to mind and the other to body. The science of the mind and the science of the body utilize different languages, different concepts (with differing levels of abstraction and complexity), different sets of tools and techniques. (p. 479)

Since the methodological and heuristic devices used to understand the psyche and soma are different, there is no common language that lends itself to a causative explanation between the two realms. One is left with covariance data where one demonstrates a coincidence of events occurring in the two realms within a specific time interval at a frequency beyond chance.
Besides dealing with the difficulty of devising a theory based on covariance data, theoretical confusion arises when one does not take into account the phases of any disease. Research has identified three phases in the development of illness (Reiser, 1975). The first phase consists of constitutional factors (genetic and environmental) which predispose an organism to the capacity for a specific disease. The second phase is the actual occurrence of the illness with specific precipitating factors. The last phase is the period which ensues the onset of the disease. The problem occurs when one fails to associate the psychological and physiological data with the specific phase of the illness. Reiser (1975) identifies the problem clearly and concisely:

Both the psychological and physiological medical data differ in fundamental and important ways, depending upon the phase of the natural history of the disease that is under study, and it clearly may be misleading, and probably quite incorrect to assume that analysis of the circumstances and mechanisms involved in precipitation of an illness, or in influencing its course, (no matter how thoroughly studied and formulated), would necessarily bear any direct relevance for understanding the mechanisms that had been involved in establishing predisposition. A priori, one might very well expect that in considering predisposing factors, disease-specific influences might very well overshadow nonspecific mechanisms in importance, whereas it is entirely plausible that mechanisms involved in precipitating the onset of disease, and in influencing the course of disease once established, might involve nonspecific mechanisms more importantly. (p. 480)

In other words, the precipitate factor(s) to the onset of
a disease may or may not be the same factor(s) that predispose, or are involved in, the continuation of a disease. These two problems, covariance data and failing to recognize the need to associate data with the phase of the disease, have hampered the development of a comprehensive theory in the field of psychosomatic medicine. Then, in part, the divergent definitions of stress as they seek to explain psychosomatic illness are the results of the struggle to define where and how psyche and soma interrelate in the context of a stressful situation. The ensuing pages explore how the concept of stress has undergone changes with each research trend. Each trend struggles with where and how psyche and soma interrelate in a stress paradigm.

**Historical Precursors**

Psychosomatic medicine has been greatly influenced by psychosomatic theorists. Prior to discussing their influence on psychosomatic medicine, we first need to look at the sequential problem between psyche and soma. This problem addresses the first definitional problem of sequential order of the covariance data.

James (1950) devised a theory concerning the chain of neural events that lead to the actual emotional experience. Lange also proposed this theory at or about
the same time as James (cited in Kagan & Haveman, 1972). The James-Lange theory of emotional response proposes that a stimulus produces a visceral response and it is the visceral response that determines the emotion. Prior to this proposal, it was taken for granted that a stimulus triggers an emotion which in turn produces a behavior. From this theory, it follows that for each emotion there should be a different pattern of bodily activity. Research in the area of anger and fear have supported this theory by identifying hormonal changes associated with these emotions (Kagan & Haveman, 1972). Research, however, has not identified behavior patterns specific to other emotions. In addition, the sensitivity of the viscera and its rather slow response to the autonomic nervous system does not account for the rapid change in emotions seen in organisms.

In the late 1920s, Cannon scientifically attacked the James-Lange theory. Prior to Cannon's (1927) attack, the James-Lange theory had been dismissed by psychologists and psychiatrists on common-sense grounds. Cannon (1927) claimed, since visceral responses depend in part on endocrine function which is slow to react hormonally, visceral response cannot precede the rapid changes in emotion seen in individuals. The Cannon-Bard theory of emotion proposes that stimuli cause the hypothalamus to fire signals to the autonomic nervous
system that triggers visceral changes associated with emotion. At the same time, the hypothalamus sends signals to the cerebral cortex that result in the feeling of emotion. Classic studies undertaken by Cannon support this theory (Schneider & Tarshis, 1975).

It is important to note that the Cannon-Bard theory does not address how the psyche affects the soma from a psycho-physiological basis. The theory, however, lent support to the paradigm that psyche precedes the soma even though it does not solve the causative relationship when one examines psyche and soma data. This bidirectional focus of psyche preceding soma was used as a basis for the psychoanalytic theorists who coined the term psychosomatic illness as a manifestation of one's reaction to stress (Kaplan & Sadock, 1981).

Psychoanalytic Influence on Psychosomatic Medicine

Historically, the concept of psychosomatic illness was proposed by the psychoanalytic community. The first individual to use the term psychosomatic was Heinroth (cited in Kaplan & Sadock, 1981) in 1880 when he used the term in regards to insomnia. The term psychosomatic was popularized by Jacobi, a German psychiatrist. Some of the disorders that are listed as psychosomatic illnesses are ulcerative colitis, rheumatoid arthritis, coronary heart disease, obesity, tension and migraine headaches.
Zegan (1982) in his review of the psychosomatic perspective states, "The psychosomatic movement began with an interest in identifying those personal response mechanisms that place some individuals, by virtue of their personality and life history, at selective risk for certain diseases" (p. 143). Furthermore, this perspective of psychosomatic illness based on psychoanalytic theory is seen as a manifestation of conflict.

Freud, the father of psychoanalytic theory, viewed man as being driven by instinct, mainly sexual impulses. Man's psychological functions derive their energy from the biological instincts. The libidinal or sexual impulses of the id are mediated by the development of the ego and later the superego. The main function of the ego is to obtain the blind impulses of the id within the constraints of reality. An individual develops certain personality characteristics over time by developing direct and rational, as well as indirect, ego defense mechanisms which enables him to express his unconscious motives. In Freud's early work, he viewed various physical symptoms as a symbolic expression of unconscious, repressed instinctual drives in a disguised form because its direct expression was blocked by reality constraints mediated by the ego. Freud labeled this process of indirect expression of repressed, instinctual
drives through bodily symptoms as conversion hysteria phenomena (Corey, 1977; Rychlak, 1981).

Freud's conversion hysteria served as a template for the work of later psychoanalytic theorists and their conceptualization of how certain personality characteristics effects the soma in response to stress. While conversion hysteria involves organs innervated by the central nervous system and voluntary neuromuscular system, Ferenczi (cited in Kaplan & Sadock, 1981), applied conversion hysteria to organs innervated by the autonomic nervous system. Ferenczi stated ulcerative colitis was the representation or expression of a specific psychic fantasy. Diseases such as colitis are known today as psychosomatic diseases that occur only in organs innervated by the autonomic nervous system.

Freud's conceptualization of the interrelationship between psyche and soma was the impetus for other theorists to search for specific elements in one's psychological development that might function in the etiological and pathogenic process and contribute to choice of symptoms and illnesses. In other words, certain physiologic symptoms are functionally related to specific personality factors. This trend of specific pathways between psyche and soma was taken forward by Alexander (1943) with his studies of patients having chronic organic illness in which emotional conflicts were
thought to play a considerable part. Alexander believed that when stress occurred it was manifested in a specific response in a predetermined organ. He viewed conflict as a form of stress which, if suppressed, may produce a visceral neurosis as opposed to conversion hysteria which was a symbolic representation of suppressed instinctual impulses. The visceral neurosis involves chronic affect associated with unresolved conflict and accompanied by its autonomic physiologic component. A visceral neurosis will occur if the suppressed childhood conflict is reactivated by a situation in adulthood. If the reactivation is prolonged, eventual pathology of the organs may occur. Alexander (1943) defines three factors necessary for pathology to occur: a genetic vulnerability of a specific organ, a predisposing emotional pattern and a precipitating external situation. Finally, Alexander relied heavily on the psychodynamic interpretation of the predisposing conflict and how it is tied to a specific autonomic dysfunction manifested in a specific organ. Mirsky (1958), in his studies on gastric secretory activity associated with duodenal ulcers, has supported Alexander's visceral neurosis concept.

While Alexander emphasized a strong psychodynamic interpretation of unresolved personality, Wolff (1950) focused on personality features or behaviors that were directly observable with little or no inference. These
personality features were associated with specific responses in particular organ systems. He too viewed body reactions as depending on the subject's nature, his past experience and the situation.

Alexander and Wolff with other, less well-known psychoanalytic theorists, focused their attention predominately on intrapsychic issues and/or interpersonal behaviors and their association with the autonomic nervous system mediating visceral organs. They gave little attention to multi-factor concepts; such as external social systems, behavioral components and detailed physiologic reactions. In summary, these theories have been oversimplified and supported on a paucity of data.

While in general, diseases categorized under the psychosomatic heading have not been linked directly to personality and behavioral traits, coronary heart disease (CHD) studies have shown a positive correlation. As early as the late 1800s, Van Dusch and Osler (cited in Rosenman & Chesney, 1982) observed that hard driving behavior, excessive work involvement and stress were predisposing factors to CHD (cited in Rosenman & Chesney, 1982). Again in the 1940s, Dunbar (1943) described ambitious, executive type individuals as likely candidates to develop CHD. Over the past twenty years, extensive research has been done by Rosenman and
associates (Rosenman, Brand, Scholtz, & Friedman, 1976; Rosenman, 1978; Rosenman, & Chesney, 1982) with the behavioral and personality factors associated with CHD. In the medical field it was generally accepted that high risk factors associated with CHD were high blood pressure, elevated serum lipid-lipoproteins, poor dietary and exercise habits, and cigarette smoking. Studies have found that CHD patients show no difference in the level of risk factors as identified by the medical field from patterns prevailing in the general population (Mann, 1977). Rosenman and Chesney (1982) state, "Finally, neither altered diet, nor physical conditioning, nor decrease of standard risk factors has been shown significantly to decrease the mortality rates of CHD or reinfarction, despite the 'unremarkable aura of faith' in such treatment" (p. 548).

CHD has been linked to Type A behavioral pattern (TABP) in longitudinal studies (Haynes, Feinleib, Levine, Scotch, & Kannel, 1978; Rosenman et al., 1976). The TABP profile is identified by qualities such as orderly, highly competitive, impatient, rapid and emphatic speech stylistics, and expressing signs of anger when under stress. These longitudinal studies indicate that an individual with TABP doubles the risk of CHD even when all other levels of other risk factors are adjusted for. In contrast with individuals with TABP, persons without
such attributes are called Type B. These individuals are rather relaxed, satisfied with life, and exhibit unhurried behavior. Type B individuals are twice as likely not to develop CHD. Whereas TABP individuals are challenged by a task, they differ from individuals with classic anxiety states who become overwhelmed by challenges and tend to avoid them (Rosenman & Chesney, 1982).

Traditionally, the TABP profile has been identified by the technique called the Structured Interview (SI). The SI is a fifteen minute interview that is taped and subsequently rated by trained individuals who take into account stylistics of speech, content of answers, and nonverbal behavior (Rosenman, 1978). While this method continues to be the best determinant of TABP, the Jenkins Activity Survey (JAS) is the best studied questionnaire providing a TABP profile and is now available for clinical use (Jenkins, Rosenman, & Zyzanski, 1979).

Rosenman and Chesney's (1982) review of the literature on CHD and TABP found little correlation between psychopathology and genetics. The influence of parental attitudes and behaviors on a child's development (Matthews & Saal, 1978) and cultural factors (Cohen, Syme, Jenkins, Dagan, & Zyzanski, 1975) appear to play an important role in the development of TABP. These and the previously mentioned studies show a relationship between
the environmental milieu when perceived as a challenge and those individuals with a characteristic response pattern, and given this response pattern, they are likely to develop CHD.

Although research has shown a specific pathway regarding stress (challenging environment) and TABP associated with CHD, this is an exception. A second trend in psychosomatic medicine began to look at nonspecific pathways. This trend in research sought to describe and identify factors of stress without identifying specific pathways between psyche and soma and its reaction to stress. The second trend of research focused on stress as a response or as a stimulus.

Stress Defined as a Response

Behavioral Response

This area of research has operationally defined human nature in terms of one's behavioral response. The way an individual responds to stimuli in the environment can be categorized as a classical or operant conditioned response.

Classical Conditioning

While psychoanalytic theorists sought to find psychological characteristics that rendered individuals vulnerable to stress related disorders, researchers
looking at nonspecific pathways focused their attention on either the response or stimuli of the stressful situation. The work of defining stress as a response began with Pavlov (cited in Hilgard, Atkinson, & Atkinson, 1971), a Russian physiologist. He discovered a learning phenomena, later termed classical conditioning, while examining the functional relationship between salivation and digestion in dogs. Pavlov discovered that an unconditioned stimulus (US) produced a reflexive, unconditioned response (UR). When food, US, was placed in the visual sight of a dog, it produced salivation, UR. When a conditioned stimulus (CS) such as a tone was paired with the US food in repeated trials, it evoked the dogs salivation. Pavlov labeled the salivation paired with the CS, i.e., the tone, a conditioned response (CR). Pavlov went on to discover that a CS could be generalized to stimuli similar in nature and termed this "stimulus generalization." He also looked at the importance of time, sequencing of the CS and US as well as extinction. From a theoretical standpoint, Pavlov's research stood in direct contrast to psychoanalytic research which focused on identifying specific personality variables which would render individuals vulnerable to stress related disorders (Hilgard et al., 1971; Silverman, 1978). Pavlov's research was the beginning of Behaviorism, a new trend in research which focused on how an individual learns a
response. This behavioral perspective began to view psychosomatic illness as a result of a maladaptive response to a stimulus which could only be treated by modifying one's response using classical conditioning.

Operant Conditioning

While Pavlov's work in the early 1900s was the beginning of Behaviorism, Skinner (1938) marked a new approach in the study of learning which is now termed operant conditioning. He found that only a few learned behaviors can be attributed to classical conditioning while most behaviors can be attributed to the operant conditioning model of learning. In classical conditioning, the stimulus acts upon the individual to evoke a response, whereas in operant conditioning the individual is active and his response results in a reinforcing stimulus. Skinner, in his studies using the famous chamber called the Skinner Box, found that animals could be trained to deliver certain responses given they were positively reinforced. His major contributions include the scheduling of reinforcement in addition to his view of how behaviors are extinguished and stimulus generalization occurs using the operand mode. Skinner (1948) stated that man and society can be improved by the way one reinforces an individual's behavior. Skinner has become a leader in behavioral psychology where the
importance has focused on the response and how it is modified by the reinforcing stimuli. The operant model, however, does not consider how one's psyche or cognitive functions affect the way one responds to environmental stimuli.

Traditionally, it was thought that autonomic mediated behavior could only be modified by classical conditioning. Initially, the assumption that psychosomatic illnesses are defined as those illnesses directly influenced by the autonomic nervous system prevented therapists from using operant conditioning to treat psychosomatic illness. This assumption was stated by Kimble (cited in Blanchard & Epstein, 1978) in the following statement: "Thus, for autonomically mediated behavior, the evidence points unequivocally to the conclusion that such responses can be modified by classical, but not instrumental, training methods" (p. 100). This statement was an impetus for Miller (1969) to prove that operant conditioning could be used to modify smooth or involuntary muscles (intervated by autonomic nervous system) as well as voluntary, skeletal muscles. Miller and his associates devised a series of laboratory studies where rats were given curare which paralyzes all skeletal muscles but leaves smooth muscles functionally intact (DiCara & Miller, 1968; Miller, 1969). With an electrode implanted in the reward or pleasure center of
the hypothalamus, they were able to show by the use of operant conditioning that attempts to replicate these studies did not hold up (Miller & Dworkin, 1974), but this did not stop the development of the field of biofeedback. Biofeedback is actually an extension of the theoretical conceptualization of operant conditioning applied as a treatment modality in psychosomatic medicine. In the treatment of psychosomatic disorders, biofeedback, using the techniques of operant conditioning, allows individuals to influence the physiologic responses associated with a specific psychosomatic disorder. A patient comes with a physical ailment and the treatment is focused on modifying the clients physiological response. This type of training ignores the environmental, situational, psychological and antecedent stressors critical to the production of the psychosomatic disorder (Meichanbaum, 1976; Mitchell & White, 1976). Biofeedback exemplified the research trend in finding nonspecific pathways and the treatment of those factors. Biofeedback has been the major treatment modality in behavioral medicine up to the present in the treatment of psychosomatic-stress related illnesses.

**Physiological Response**

Another approach to looking at stress as a response was taken by Selye, a physiologist, in his development of
the general adaptation syndrome model. Selye (1982) stated, "My definition of stress is the nonspecific (that is, common) results of any demand upon the body, be the effect mental or somatic" (p. 7). This definition defined stress by basing it on objective indicators of bodily and chemical changes that are brought on after any demand is placed upon the body. The source of stress can arise from a variety of situations ranging from pain, fear, loss of blood, to joy and unexpected success which prevents any single factor to be pinpointed as the cause of the reaction.

Selye (1936), while researching ovarian hormones, discovered in rats three unpredicted changes forming a specific syndrome. These changes included: first, the cortex of the adrenal glands becoming enlarged and hyperactive; second, shrinkage of the lymphatic structures including the thymus, spleen and lymph glands; and third, deep, bleeding ulcers in the stomach and upper intestines. These biochemical changes occurred when rats were injected with a toxic substance regardless of the toxic substance used. These changes became incorporated into the general adaptation syndrome as the initial response identified as the alarm reaction to noxious stimuli.

In ensuing research, Selye (1976) found that this alarm reaction was followed by a stage of resistance.
This phase includes the exact opposite characteristics manifested by the alarm phase. These characteristics include hemodilution, hypochloremia, and anabolism. These two phases normally occur over and over again in one's life. The syndrome of being sick was found to occur in the first phase while the body's attempt at recovery was found to occur in the second phase. These two phases occur with any type of stressor whether it be pleasant or adverse. A third phase has been found to occur with continued exposure to the noxious agent. This stage, known as the stage of exhaustion, occurs when the demand on the body is severe enough and is applied for a sufficient length of time. The stage of exhaustion results in death if the noxious agent has not been removed. Selye has theorized, based on his model, that the body has a finite amount of energy called "adaption energy." The stages of adaptation cause gradual expenditure of this energy which results in death (Selye, 1976).

Selye (1976) has found the biochemical mechanisms to support his theory of how one copes with stress biochemically. While acknowledging that the body is mediated by both neurological and vascular systems, Selye has identified the pathways in the endocrine system. The alarm reaction has been found to be produced by an unknown mediator, possibly a hormone which excites the
hypothalamus causing release of adrenocorticotropic hormone (ACTH). The secretion of corticoids, mainly glucocorticoids, has been found to be stimulated by ACTH reaching the adrenal cortex. Corticoids, through the process of gluconeogenesis, supply a ready source of energy for adaptive reactions made necessary by noxious demands. Expenditure of energy does occur in syntoxic or catatotoxic reactions to maintain homeostasis. ACTH and corticoid feedback loops to the hypothalamus terminate the stage of resistance. Psychosomatic disorders are the results of inappropriate or excessive adaptation reactions of visceral organs produced by the mechanisms of stress.

Stress Defined as a Stimulus

Traditionally, the majority of nonspecific stress research has been concerned with the response and consequences of stress rather than the antecedents. The other nonspecific definition of stress has been from researchers that define stress as a stimulus. Their focus of research has been on environmental and/or social conditions and their impact on the individual. This research stands in direct contrast with those studies that focus on the response side of nonspecific pathways.

Predominate research in this area has been done by Holmes, Rahe, and Masuda. They have looked at the
disruptive impact of acute life events and their effect on one's physical health (Holmes & Rahe, 1967; Holmes & Masuda, 1974; Rahe, 1968). Holmes and Rahe have hypothesized that it is possible to make predictions about one's susceptibility to disease in their Life Events Research Model. This determination is made by the number and or magnitude of life events occurring to an individual within a given amount of time (Holmes, 1979). The essential factor in this model is the prolonged coping efforts placed on the individual by events and they need not be of a negative character to provoke disease. Zegan (1982) has pointed this out in the following statement:

This line of research has not considered the psychological meaning or social desirability of life events but only their disruptive impact. ... The greater the strain on coping mechanisms, the more likely that an inadequate or inappropriate response will be utilized, thus eliciting an idiosyncratic or pathological physiological reaction. (p. 138)

Other research in this area has supported this model. Rahe and Lind (1971) revealed a connection between life events and sudden cardiac death. Gorsuch and Key (1974) revealed a relationship between life stress and complications with birth and pregnancy. Other researchers have shown a connection between life events and psychiatric symptomatology. Markush and Fayero (1974) and Ilfeld (1977) showed a significant relationship between life stress and depressive
disorders. A comprehensive review of the relationship between life stress and health status has been completed by Derogatis (1982).

In identifying environmental sources of stress, Pearlin has been a major contributor. Pearlin (1982) has defined stress as "a response of the organism to a noxious or threatening condition" (p. 369). His research has focused on identifying levels of social stress and their impact on the individual.

Pearlin's theoretical organization of social conditions as a source of stress has been categorized into very broad sources on one end of the spectrum to individual experiences on the other. On the broad end of the spectrum, Pearlin views society on the whole as a stressor. He has identified two potential sources of stress in society, social discrepancy and rapid change. Pearlin has based his work on social discrepancy as a source of stress on the work of Myrda, Steiner and Rose (1944) and Benedict (1938). Social discrepancy stressors include society's principles versus those internalized by the individual, understanding changing expectations in one's maturation process, and dealing with finite opportunities in the attainment of success. The second source of stress occurs during rapid social change. Pearlin has suggested that rapid change often requires
people to alter internalized goals, be uprooted, cut social ties or incorporate a new culture (Pearlin, 1982).

Toward the center of the spectrum, Pearlin has identified certain aspects of social organizations as a source of stress. He has suggested that all organizations in and of themselves, their structure and functioning, potentiate stress and confusion. For example, stratification into economic, status and power lines produce a stressor if one's standing is inconsistent in any one of these, such as high on status, low on economic as in the case of a college professor.

On the opposite end of the spectrum from societal pressures is individual experiences. Pearlin has separated his research on individual experiences into two types, those that are acute events and those that are repeated or chronic. The magnitude of acute events is felt to depend on the quality and desirability of the event, and whether the event is scheduled or unscheduled. Scheduled events are foreseen, and have a high probability of occurring. This high probability of occurrence decreases the stressful impact. Unscheduled events on the other hand are not expected and have been notably associated with stress (Pearlin & Lieberman, 1979). The second category of individual stressors, those that are repeated or chronic, have been found by some researchers to exert more stressful pressure than
acute events. Examples of these are chronic strains in marital or parent-child relationships.

The correlation between acute life stress and seriousness of illness has found only modest significance. Retrospective self reports have shown correlations of 0.2 – 0.3 and prospective studies have shown correlations of up to .12 (Schroeder & Costa, 1984). Recent research has focused on chronic life strains/ daily hassles to be better predictors of subsequent physical and emotional health (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982; Eckenrode, 1984; Kanner, Coyne, Schaefer, & Lazarus, 1981). In review, this research on acute and chronic life events stands in direct contrast to those that focus on the response side of nonspecific pathways.

Stress Defined as a Mediating Process

While the above research looked at the stimulus or the response to stress, research done by Schachter (Schachter & Singer, 1962) looked at the stimulus and physiologic response to stress. He hypothesized that emotion is dependent on heightened physiologic arousal and the situational context in which it occurs. Schachter developed an ingenious experiment to test this hypothesis. Two college groups were given injections of Epinephrine disguised as a vitamin compound. One group

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was informed of its true side effects while the other group was not provided with similar information. Both groups were exposed to two different situations, one where a confederate behaved in a highly euphoric manner or demonstrated extreme signs of anger. It was hypothesized that the informed group would attribute their heightened arousal to the drug and be largely unaffected by the behavior of the confederate while the uninformed group would contribute their heightened physiologic arousal in part to the situational context, either becoming more happy or angry, respectively. The findings supported Schachter's hypothesis that feelings of heightened physiologic arousal for which we have no ready explanation will often be interpreted in terms of various other factors which adds further support to the Cognitive Theory of Emotion. In regards to stress research, this led to the third trend in explaining stress. The focus moved away from the response or the stimulus of stress to acknowledging that a mediating process is important in the overall picture of one's reaction to stress.

Stress research within the last fifteen years has returned to a focus on the psychological factors and how they affect or mediate one's overall response to stress. Whereas research in psychosomatic medicine initially sought to find a direct link between personality and
disease, the present focus has been on how one
cognitively mediates the stress. The impetus for the
present movement can be traced to a series of articles
between Mason (1975a, 1975b) and Selye (1975) in the
Journal of Human Stress. Mason (1975a) reviewed Selye's
stress concept and found that there are two main features
of Selye's formulation regarding stress and the General
Adaptation Syndrome. Mason (1975a) states:

First, it should be emphasized that Selye places
great importance on the distinction that stress
is a physiological response within the organ­
ism elicited by evocative agents, and that
"stress" must not be confused with such evoc­
ative agents, which should be called "stressors."
Secondly, the concept of physiological nonspec­
ificity of the stress response, i.e., the con­
cept that stress is elicited by a wide variety
of different agents by "any demand." (p. 12)

In regard to Selye's first position that stress is a
physiological response within the organism, Mason (1975b)
indicated the research has shown that the
pituitary-adrenal-cortical system which evokes the
physiological triad discovered by Selye and denoted the
alarm reaction of the General Adaptation Syndrome (GAS)
is quite sensitive to psychological and social
influences. Mason (1975b) stated, "Conventional
laboratory situations designed for the study of physical
stressors, such as exercise, heat, cold, etc., very often
elicit an appreciable degree of emotional disturbance,
discomfort, or even pain" (p. 24). Mason, in a series of
experiments, sought to control the psychological
component involved in administration of various stressors. He found in his studies with both human and monkey subjects that heat, which is generally regarded as a noxious stimuli, does not change adrenal-cortical hormone levels when measures are taken to avoid sudden temperature changes. He found similar results when applying moderate exercise and fasting as the noxious stimuli. This led Mason to conclude that there is not a relatively simple reaction between noxious, afferent inputs producing physiological outputs in the organism but one that also involves the psychological process of arousal in concordance with the noxious agents. In other words, a stimulus becomes noxious when it produces emotional arousal which sets off the General Adaptation Syndrome. Mason went on further to postulate that the "first mediator" that produces the alarm reaction may be the emotional arousal.

Selye's second position of absolute physiological nonspecificity of the stress response has also been challenged by Mason (1975b). He cited research which contradicts the absolute nonspecificity noting that there are other hormonal changes in addition to a rise in adrenocorticotrophic hormone as hypothesized by Selye. Secondly, the above research indicated that there is not only physiologic changes but also emotional arousal which mediates the physiological component to varying degrees.
Selye's (1975) rebuttle to Mason's articles did not address directly or refute completely Mason's two key issues which suggested that Selye's model was overly simplistic, especially regarding psychological mediation. Mason's research on the importance of psychological mediation was an impetus for the study of cognitive mediating factors in relationship to stress.

Lazarus has emerged over the past twenty years as the foremost authority on mediational psychological processes in the stress phenomenon. He defined stress as a global construct involving both the person and the environment in stating stress as, "The reactions themselves, and the various intervening processes" (Lazarus, 1966, p. 27). While defining stress as a global construct, the primary focus has been on the mediational processes involving evaluation and judgement as crucial elements of the stress reaction (Holroyd & Lazarus, 1982). For psychological stress to occur it requires a judgment that external or internal demands exceed the individuals resources for managing them in Lazarus' model. This judgement and how one manages the stress experience has been conceptualized in terms of two interacting processes, appraisal and coping (Lazarus, 1966; Lazarus & Folkman, 1982).

Central to the stress theory in Lazarus' model is appraisal. Appraisal is the evaluative process where a
situational encounter is given meaning by the individual. Appraisal has been separated into two subtypes, appraisal of what is at stake and appraisal of coping. Appraisal of what is at stake involves three categories, evaluating a situation as a threat, harm-loss or as a challenge. Appraisals of threat or harm-loss are distinguished by their time perspective. Threat is anticipation of imminent harm while harm-loss is the judgement that damage has already occurred. "Challenge" involves both the judgement that a situational encounter is potentially harmful or has the potential for gain and the individual can influence the outcome. Appraisal of coping is the evaluation of one's options and resources which is influenced by one's past experience in similar situations, beliefs (Epstein, 1982), and availability of resources. This appraisal process is not necessarily rational since the human mind has cognitive limitations, and is affected by emotions. It involves risk and decisions which are made within a time constraint. Janis and Mann (1977) have elaborated on this appraisal process and have developed a decision tree taking into account the above factors. Following appraisal in Lazarus' model is the interacting process of coping which involves an individual's effort to manage a situation. Lazarus focused on actual thoughts and doings during stressful situations as opposed to individual differences involving
personality traits in response to stress. Folkman and Lazarus' (1980) examination of coping strategies of one hundred middle aged adults during more than 1300 stressful encounters found that stressors in their environment were not met by a constellation of both problem-focused and emotion-focused activities. Holroyd and Lazarus (1982) have reviewed research that supports Lazarus' model.

Cognitive behavioral therapists and researchers of which Lazarus is one, have been interested in psychological interventions that are designed to reduce psychological and somatic costs by facilitating effective coping. These cognitive behavioral interventions seek to reduce somatic costs of stress by teaching individuals to manage stress by more effective coping strategies (Holroyd, 1979; Meichenbaum, 1976). This type of intervention is in contrast to the biofeedback approach to stress management where individuals are taught to directly regulate stress related physiological responses. The cognitive behavioral approach to stress involves three segments: (a) identifying thoughts and behaviors which aggravate and maintain the stress response, (b) developing more effective coping strategies, and (c) adapting these strategies to one's needs and changing environmental demands.
Another important researcher in the area of mediational processes as related to the stress phenomenon is Endler. He has identified himself as an interactionalist. Interactional psychology stems from the work of Lewis (1935) and more recently the work of Endler and Hunt (1966) and Mischel (1973).

According to Endler and Magnusson (1976), there are four basic postulates to interactional psychology: (a) behavior is a function of a continuous and bidirectional process of person-situation interaction; (b) the individual is an intentional, active agent in this process; (c) motivational, emotional, and cognitive variables play important determining roles on the person side; and (d) the psychological meaning that the situation has for the person is an essential determining factor of behavior (Endler & Edwards, 1982). In the study of stress and anxiety, Endler (1975, 1980) has recently proposed an interactional model of anxiety. Endler has developed his model based on the work of Spielberger (1972, 1975), whose work looked at the difference between state anxiety (A-state) and trait anxiety (A-trait). In defining stress, Spielberger (1976) defined stress as the objective stimulus properties of a situation and threat as the person's perception of a situation as being dangerous to him/her. Whereas Lazarus (1966) has viewed stress as a global
response and emphasized the cognitive appraisal of threat in the interaction between person and environment, Endler (1975, 1980) in his model has emphasized the emotional component of the threat. In Endler's model, stress, a situational variable, is influenced by the individual's predisposition to react to stress with increased anxiety, that is trait-anxiety. The perception of stress/threat influences one's present emotional condition or A-state. Furthermore, this model conceptualizes trait anxiety as multidimensional, resulting from three situational factors which are interpersonal (ego) threat, physical danger, and ambiguous threat as based on the work of Endler, Hunt, and Rosenstein (1962). The interactional model of anxiety proposes that:

Both the type of threat perceived in a stressful situation and the dimension of A-trait must be considered in predicting changes in A-state. A person-situation interaction producing changes in A-state would be expected to occur only when the dimension of A-trait and the type of stress in the situation were congruent. That is, an individual high in physical danger A-trait would be predicted to show increases in A-state in a physically dangerous situation; no such changes would be predicted for an individual low in physical danger A-trait. When the dimension of A-trait and the situational stress are not congruent, no interaction prompting changes in A-state would be anticipated. Thus, it is necessary for research on stress and anxiety to consider persons, situation, and the multidimensionality of the constructs. (Endler & Edwards, 1982, p 40)

Endler and Edwards (1982) in their review of the literature show support for this model.
Summary

In summary, the review of the literature on psychosomatic medicine does point to an epidemiological progression from viewing the relationship between psyche and soma from a specific pathway to nonspecific pathways and then again to a specific pathway involving a mediational process between psyche and soma. The first trend focused on how personality traits effected the soma. When this research produced a paucity of evidence, the trend turned to non-specific pathways. The second trend looked at how psychosomatic illness was associated with behavioral response, physiological response and stimuli, but did not look at cause and effect, in that cause x produced psychosomatic illness y. In the last twenty years, the "Zeitgeist" has been what we are thinking, doing and feeling, that is the mediational process which involves an active agent who can affect and be affected by the situational variables. The research is again narrowing the focus, as has been the previous trends. The stress management classes that are the vogue intervention of this age are intuitively sound but lack deductive validity. In conclusion, research must focus on one's response, and mediational processes to understand how one reacts to stress in this multifactoral phenomenon. The future trend, if the knowledge of
psychosomatic illness is to progress, must be tackled from a multidimensional approach.
CHAPTER III

METHOD

Population and Sample

Population

The population for this study was naval recruits entering naval recruit training at Great Lakes Naval Recruit Training Command, Great Lakes, Illinois. Generally, these subjects can be described as males of average intelligence, ranging in age from 17 - 34. Naval recruits represent a wide range of socioeconomic backgrounds; the majority are single and have a high school education.

The research site, Great Lakes Naval Recruit Training Command, is the largest of three naval recruit training commands with over one million total graduates, thirty-five thousand annually, who are involved in the Friday graduations 51 weeks every year. The largest number of recruits begin in summer and fall. Recruits must learn respect, self-discipline, and attention to detail in the rigorous eight week training program. Their patriotism, pride, personal conduct, spirit and physical fitness are all tested and developed during the eight weeks they spend entirely on the base. The first
three weeks are the toughest with the day beginning at 0530 (5:30 a.m.) and ending at 2130 (9:30 p.m.). They all live and work closely together to learn military law, military drills, regimentation, personal grooming, and correct wearing of the uniform. Recruits must meet basic academic and physical fitness requirements. Approximately 90% of the recruits beginning training graduate. Half of those discharged do not graduate for medical and psychological reasons while the other half occur because of failure to meet basic academic and physical fitness requirements. After graduation from basic training, 30% go on to become members of the fleet, e.g., seamen, firefighters, and airmen, while 70% go on to service schools for advanced training in job skills.

All recruits will have received a complete physical examination within one year prior to the commencement of basic training and will begin training in a basically healthy state.

Sample

Six companies of naval recruits entering Great Lakes Naval Recruit Training Command, Great Lakes, Illinois, on March 11 and 12, 1986, were candidates for this study. The candidates, totalling 462, selected for this study were considered representative of the total population of recruits. The population of naval recruits entering
training during the summer and fall months is often a more homogeneous group than those entering during winter and spring months due to the fact that most of the later group are recent high school graduates. Those that begin training in winter and spring include high school graduates, those who have not completed high school, those with high school equivalency, those with college experience and others whose sole purpose in joining the navy is employment.

The nature and purpose of this study was described to the recruits before completing the first set of questionnaires. They were asked to participate by agreeing to complete the criteria questionnaires. Candidates were informed that their participation was voluntary, feedback regarding the project would be available and their participation would not affect their rating during training. Permission was obtained from the Naval Clinical Investigation Committee and the Naval Committee for the Protection of Human Subjects to use the criteria instruments, the Cornell Medical Health Index and the Ways of Coping Checklist Revised. The criteria instruments were administered on the second day of training and 18 days later in the eight week program. Fifty-four subjects were excluded from the study on the initial or second test administration due to their unwillingness to participate or failure to complete the
questionnaires. Subjects were excluded from the study after the initial testing for the following reasons: (a) seventy subjects were transferred to other companies for failure to meet physical or educational requirements, (b) one subject was given a medical discharge from the U.S. Navy, and (c) one subject was formally discharged for being on an unauthorized absence.

The resulting sample consisted of 336 subjects from the 462 recruits who comprised the six companies involved in this study. The mean age of all male recruits was 20.0 years. The mean educational level was 11.9 years. The majority of the sample were single and geographically from the mid-atlantic, midwest, and southern United States. The mean socioeconomic level for their supporting parental unit was 21,000 dollars to 30,000 dollars.

Diagnostic Conditions

For the purpose of this study, clinical symptoms were defined by the Cornell Medical Index Health Questionnaire (CMI) and coping style by the Ways of Coping Checklist Revised (WCCL Revised).

Clinical Symptoms

Cornell Medical Index Health Questionnaire (CMI) "was derived to meet the need for an instrument suitable
for collecting a large body of pertinent medical and psychiatric data" (Brodman et al., 1949, p.2). Each question deals with some aspect of an individual's medical history. Four broad areas are covered; those relating to bodily symptoms, past illnesses, family history, and those relating to behavior, mood or feeling. This inventory was used to rate total numbers of clinical symptoms (Brodman et al, 1949) which were the number of "yes" answers (see Appendix A).

Coping Style

Coping style is the number of items scored for each of the five factors on the Ways of Coping Checklist Revised (Vitaliano et al., 1985). These five factors/scales are Problem-Focused, Seeks Social Support, Blamed Self, Wishful Thinking, and Avoidance (see Appendix B).

Criteria Instruments

The following questionnaires were used for the assessment of clinical symptoms and coping style.

Cornell Medical Index Health Questionnaire (CMI)

The Cornell Medical Index Health Questionnaire was used to determine the number of clinical symptoms. The CMI was published by Cornell University Medical College,
New York, 1949 (Brodman et al., 1949). The inventory consists of 195 questions which are answered by the subject as "yes" or "no." The number of "yes" answers on the inventory constituted the number of clinical symptoms. The questions relate to an individual's medical history. Most of the questions concentrate on the conventional categories of medical complaints while some address psychiatric problems. According to Brodman et al., (1949) "the entire form is examined to determine the number of 'yes' answers. A serious disorder is to be suspected when more than 25 items are so marked" (p. 6). They further state that "the results of clinical evaluations and statistical scoring of the CMI are similar, as shown by a coefficient of correlation of .83" (p. 6).

Ways of Coping Checklist Revised (WCCL)

The Ways of Coping Checklist Revised was used to determine the coping style factors. The WCCL Revised was originated by Vitaliano et al., (1985). The checklist consists of 46 items related to how the individual copes with a specific stressful situation. The WCCL Revised has been factor analyzed into five factors: Problem-Focused, Seeks Social Support, Blamed Self, Wishful Thinking, and Avoidance (see Appendix C). The checklist consists of 14 items related to how the
individual appraises the specific stressful situation. These items are experimental and were given, but not included in the results for the current study. Each response is assigned an integral value from zero to three which corresponds with the Likert scale where zero equals "never used" and three equals "regularly used." A subtotal score was given for each of the five factors as previously described.

Procedures

On the second day of basic training and 18 days later in the eight week training program, all subjects completed the two questionnaires: Cornell Medical Index Health Questionnaire (CMI), and the Ways of Coping Checklist Revised (WCCL). The questionnaires were identified by the individual's social security number as well as demographic data collected on the CMI.

For the first test administration, the recruits were seen on the second processing day of training. The first processing day involved the recruits arriving at Great Lakes Naval Recruit Training Command, who were assigned to a company without introduction to their company leader, received their basic gear and uniforms, and given the required military haircut. The day of test administration, the second processing day, was their inprocessing day. This day involved a physical
examination with visual and audio testing. In addition to a physical examination, they received their first set of vaccinations. After receiving their vaccines, they were administered the tests involved in this study. They were brought together for test administration by their assigned companies just prior to being introduced to their company commander whose job it is to mold them into a functional naval unit. Three companies received the initial testing on March 12, 1986, and the other three companies on March 13, 1986. Subjects were informed that their participation was voluntary and signed a Voluntary Consent Form (see Appendix D) which explained the purpose of the study. They also signed a Privacy Act Statement (see Appendix E) which allowed their results to be used in the investigation.

The second test administration was completed during their third week of training on the eighteenth day. Advance arrangements were made with the company commanders to have their assigned recruits assembled in their barracks after the evening meal for the second test administration. During both test administrations, besides being given a written copy of the questionnaires, the individual questions on the CMI and WCCL Revised were read orally by the investigator to enhance the completion and accuracy.
Statistical Hypotheses

The original research question asked whether individuals respond to stressful situations by exhibiting immediate effects by changes in their clinical symptoms. A second research question asked whether one's coping style remained consistent over a period of time when used in a stressful situation. A third research question asked the feasibility of predicting the number of clinical symptoms one will exhibit from knowledge of coping style used in stressful situations. The following hypotheses were developed to test these research questions and are presented here in null form.

Hypothesis One

There will be no significant difference in the total number of clinical symptoms reported by naval recruits as measured by the Cornell Medical Index Health Questionnaire between the initial testing and the second testing.

Hypothesis Two

There will be no significant difference in the scores for the factors on the Ways of Coping Checklist Revised between the initial testing and the second testing.
Hypothesis Three

There will be no relationship between the scores on the Ways of Coping Checklist Revised factors on testing one and the total number of clinical symptoms as measured by the Cornell Medical Index testing two.

Statistical Analysis

All data were entered on to master data sheets. The data were entered directly from the master data sheets into the Dental Research Institute computer system at Great Lakes Naval Base.

A descriptive analysis was accomplished on the results from the two questionnaire administrations. The computer program BMDP1D calculated the means and standard deviations for both the total score on the CMI and the five WCCL Revised factors. The WCCL Revised factors are Problem-Focused, Seek Social Support, Blamed Self, Wishful Thinking, and Avoidance.

To test the differences between the total number of clinical symptoms reported by naval recruits as measured by the CMI on testing one and two, the BMDP2V computer program was used to calculate a one-way analysis of variance with repeated measures.

To assess the difference between the scores for the factors on the WCCL Revised as reported on testing one and two, the BMDP2V computer program was used to
calculate a one-way analysis of variance with repeated measures.

To assess the relationship between scores on the WCCL Revised testing one and the total number of clinical symptoms as measured by the CMI testing two, the BMDPR9 computer program was used to calculate the multiple linear regression between each of the five coping factors and the total CMI score on testing two. Furthermore, a multiple linear regression using a stepwise procedure using the PMDP2R computer program was accomplished to determine the following; (a) to assess the unique contributions of the various coping style factors in the prediction of the total score on the CMI at the second testing, and (b) to determine the best fit parsimonious prediction equation from the coping style factors for prediction of the total score on the CMI at the second testing (Neter & Wasserman, 1974).

A level of significance for all statistical analyses was established at the P less than .05 level.
CHAPTER IV

RESULTS

This chapter will discuss the results of the statistical analyses conducted to test the hypotheses described in Chapter III. Additional analyses indirectly related to the statistical hypotheses were also conducted and will be described. The results of the tests of the statistical hypotheses and the additional analysis of data will be discussed in terms of implications regarding the original research question.

Data and Their Analysis

Statistical Hypotheses

To test the research questions involved in this investigation, three statistical hypotheses were developed. The statistical hypotheses are presented in the null form.

Prior to the analyses of the data concerning the statistical hypotheses, a descriptive analysis was conducted on the means and standard deviations of the total score on the CMI for both testing one and two and each of the five WCCL Revised factors. Table one shows the results of this analysis.
Table 1
A Comparison of Mean and Standard Deviations for Total CMI Scores and Factors of the WCCL Revised for Testing One and Two

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Score 1</th>
<th>Standard Deviation 1</th>
<th>Mean Score 2</th>
<th>Standard Deviation 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMI Total Score</td>
<td>15.19</td>
<td>14.29</td>
<td>15.34</td>
<td>14.54</td>
</tr>
<tr>
<td>Problem-Focused</td>
<td>29.27</td>
<td>6.20</td>
<td>30.01</td>
<td>6.11</td>
</tr>
<tr>
<td>Seeks Social Support</td>
<td>9.55</td>
<td>3.27</td>
<td>10.05</td>
<td>3.35</td>
</tr>
<tr>
<td>Blamed Self</td>
<td>4.70</td>
<td>1.98</td>
<td>4.67</td>
<td>2.13</td>
</tr>
<tr>
<td>Wishful Thinking</td>
<td>12.70</td>
<td>5.34</td>
<td>13.64</td>
<td>5.76</td>
</tr>
<tr>
<td>Avoidance</td>
<td>13.16</td>
<td>4.69</td>
<td>12.25</td>
<td>4.92</td>
</tr>
</tbody>
</table>

Note. n = 336

The CMI total score is based on the number of "yes" responses given by the naval recruits. The total possible score is 195. The WCCL Revised factors score is based on the number of responses which are assigned an integral value from zero to three which corresponds to the Likert scale where zero equals "never used" and three equals "regularly used." The total possible score for each of the five factors is as follows: Problem-Focused, 45, Seeks Social Support, 18, Blamed Self, 9, Wishful Thinking, 24, and Avoidance, 30.
Hypothesis One

There will be no significant difference in the total number of clinical symptoms reported by naval recruits as measured by the Cornell Medical Index Health Questionnaire between the initial testing and the second testing.

A one-way analysis of variance with repeated measures was conducted between the CMI total score for testing one and two. Table two shows the results of this analysis.

Table 2
An Analysis of Variance with Repeated Measures of CMI Total Score Between the CMI Testing One and Two

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>Degree of Freedom</th>
<th>Mean Square</th>
<th>F-Ratio</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Square Between</td>
<td>3.72</td>
<td>1</td>
<td>3.72</td>
<td>.08</td>
<td>.77</td>
</tr>
<tr>
<td>Mean Square Within</td>
<td>14863.28</td>
<td>335</td>
<td>44.37</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The results show no significant difference between the total number of clinical symptoms on testing one and testing two as measured by the Cornell Medical Index Health Questionnaire. Based on these results, the null hypothesis is tenable.
Hypothesis Two

There will be no significant difference in the scores for the factors on the Ways of Coping Checklist Revised between the initial testing and the second testing.

A one-way analysis of variance with repeated measures was conducted between the scores of the factors on the WCCL Revised for testing one and two. Table three shows the results of this analysis.

Table 3
Analysis of Variance for Repeated Measures of the WCCL Revised Factors Between Testing One and Two

<table>
<thead>
<tr>
<th>WCCL Revised Factors</th>
<th>Mean Square</th>
<th>F-Ratio</th>
<th>F-Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem-Focused</td>
<td>92.27</td>
<td>6.23</td>
<td>.0130*</td>
</tr>
<tr>
<td>Seeks Social Support</td>
<td>41.50</td>
<td>8.09</td>
<td>.0047*</td>
</tr>
<tr>
<td>Blamed Self</td>
<td>.12</td>
<td>.06</td>
<td>.8047</td>
</tr>
<tr>
<td>Wishful Thinking</td>
<td>151.43</td>
<td>13.77</td>
<td>.0002*</td>
</tr>
<tr>
<td>Avoidance</td>
<td>137.52</td>
<td>12.75</td>
<td>.0004*</td>
</tr>
</tbody>
</table>

*P less than .05
Note. n = 336
df = 334

The results show significant difference between coping factors except for the Blamed Self scale. The lowest level of significance among the scales showing significant difference appears on the scale
Problem-Focused. Based on these results, the null hypothesis was rejected.

**Hypothesis Three**

There will be no relationship between the scores on the Ways of Coping Checklist Revised factors on testing one and the total number of clinical symptoms as measured by the Cornell Medical Index testing two.

In order to test this hypothesis, a multiple linear regression was conducted between each of the five coping factors on testing one and the total CMI score on testing two. Furthermore, a multiple linear regression using a stepwise procedure was accomplished to determine the following: (a) To assess the unique contributions of the total score on the CMI at the second testing; and (b) To determine the best fit parsimonious prediction equation from the coping style factors for prediction of the total score on the CMI on the second testing. The program used to calculate the multiple linear regression correlation also produced a Pearson-Product moment correlational analysis between the five WCCL Revised factor scores on testing one and the total CMI score testing two. Table four shows the results of this analysis.
Table 4

Pearson-Product Correlation Coefficients Between the WCCL Revised Factor Scores Testing One and CMI Total Scores on Testing Two

<table>
<thead>
<tr>
<th>WCCL Revised Factors</th>
<th>Correlation Coefficient (r)</th>
<th>T Value Obtained</th>
<th>Significant Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem-Focused</td>
<td>-.062</td>
<td>-1.135</td>
<td>.272</td>
</tr>
<tr>
<td>Seeks Social Support</td>
<td>-.063</td>
<td>-1.15</td>
<td>.270</td>
</tr>
<tr>
<td>Blamed Self</td>
<td>.139</td>
<td>2.56</td>
<td>.012*</td>
</tr>
<tr>
<td>Wishful Thinking</td>
<td>.362</td>
<td>7.10</td>
<td>.001*</td>
</tr>
<tr>
<td>Avoidance</td>
<td>.288</td>
<td>5.50</td>
<td>.001*</td>
</tr>
</tbody>
</table>

*P less than .05
Note. n = > 336
df = 334

The results show a significant difference at the P less than .05 level between the coping factors Blamed Self, Wishful Thinking, and Avoidance and clinical symptoms as measured by the CMI on testing two. The coping factor Wishful Thinking had the highest correlation of .362 with the CMI. The coping factor Avoidance, with a correlation of .288 had the second highest correlation with the criterion instrument. The third coping factor which was significantly correlated with the CMI was Blamed Self with a correlation of .139. These results suggest there is a positive significant correlation between coping factors as predictors of clinical symptoms.
The multiple linear regression was calculated to determine the unique contributions of coping factors on testing one as predictive variables for the prediction of the number of clinical symptoms on testing two. The unique contribution of coping factors to prediction of clinical symptoms was a correlation of .41 which is significant at \( P < .05 \). This significant correlation accounts for an adjusted \( R^2 \) squared variance of .158 in predicting the number of clinical symptoms on testing two.

Furthermore, the multiple linear regression using a stepwise procedure produced the following results using a forward entry criteria stepping algorithm of \( F = 4.0 \) as the \( F \)-to-enter limit for each coping variable when entered one at a time into the multiple linear regression. This equation produced the best fit parsimonious prediction equation, see table five.
### Table 5

**Summary of the Stepwise Regression Steps Between Coping Factors Testing One and Total CMI Score Testing Two**

<table>
<thead>
<tr>
<th>Step Number</th>
<th>Variable Entered</th>
<th>R</th>
<th>R Squared</th>
<th>Increase in R Squared</th>
<th>F-to Enter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Wishful Thinking</td>
<td>* .362</td>
<td>.131</td>
<td>.131</td>
<td>50.40</td>
</tr>
<tr>
<td>2</td>
<td>Seeks Social Support</td>
<td>* .383</td>
<td>.147</td>
<td>.016</td>
<td>6.08</td>
</tr>
<tr>
<td>3</td>
<td>Avoidance</td>
<td>* .399</td>
<td>.159</td>
<td>.013</td>
<td>4.96</td>
</tr>
</tbody>
</table>

*P less than .05

These results indicate that a total of three steps were performed in the stepwise procedure resulting in three coping factors making a unique contribution to the prediction equation with the F-to-enter limit set at 4.0. These variables are Wishful Thinking, Seeks Social Support, and Avoidance. The correlation of these variables with the clinical symptoms on testing two is .400 which is significant at P less than .05. Based on the above results, the null hypothesis may be rejected.

### Additional Analysis

The results of the statistical analyses supported the rejection of the second and third statistical hypotheses. However, there was no statistical support for the rejection of hypothesis one. Of the subjects who participated in the study, 54 were excluded from the
participated in the study, 54 were excluded from the study on the initial or second test administration due to their unwillingness to participate or failure to complete the questionnaires. Subjects were excluded from the study after the initial testing for the following reasons: (a) 70 subjects were transferred to other companies for failure to pass physical or educational requirements, (b) 1 subject was given a medical discharge from the navy, and (c) 1 subject as formally discharged for being on an unauthorized absence. The 70 subjects transferred to other companies for failure to pass requirements may have been an important factor as to why no significant change occurred in clinical symptoms on testing one in comparison to testing two. These individuals may have been experiencing a significantly greater degree of stress than those who were successfully completing basic requirements. To assess the difference between the degree of stress being experienced by those who failed to meet basic requirements, a one-way analysis of variance was conducted between mean scores on the CMI for testing one. The results of that analysis are presented in table six.
Table 6
Analysis of Variance for Dependent Measures of CMI Total Score Between Transferred and Non-Transferred Subjects

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>Degrees Freedom</th>
<th>Mean</th>
<th>F Value</th>
<th>Significant Squared Obtained Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>730.20</td>
<td>1</td>
<td>730.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td>198841.72</td>
<td>452</td>
<td>240.80</td>
<td>3.03</td>
<td>.0823</td>
</tr>
</tbody>
</table>

Note. n = 454

The results indicate there is not a significant difference at the P less than .05 between the level of stress in those transferred and those not transferred at the onset of basic training. The mean level of stress for non-transferred subjects in comparison to transfer subjects was 15.45 and 18.96 respectively.

Discussion

The results which have been described will be discussed in terms of their implications to the cognitively oriented theory of stress developed by Lazarus (1966). This study examined three research objectives related to Lazarus theory of stress. The first research objective examined the extent to which individual's respond to a stressful situation by exhibiting immediate effects by changes in their clinical symptoms. It was hypothesized that the clinical
symptoms, that is, immediate effects, would not change during basic training. The results indicated no change in clinical symptoms over the 18 day period between testing one and two. This finding did not support the clinical observations made by navy personnel associated with basic training. While a change was not found in clinical symptoms, the level of stress as measured by the clinical symptoms was greater than the level of stress for military personnel and civilians who volunteered for an Antarctica research assignment but had not yet gone (Seymour, 1976). The volunteers for the Antarctica group were a healthy group having relatively few symptoms. They had a mean average on the CMI of 8.69 in comparison to the marginal mean of the recruits of 15.26. This difference in the level of stress between the two groups would support the tenet that the recruits were experiencing a stressful situation noting their number of clinical symptoms when compared to a normal, healthy group who were not experiencing a stressful situation at the time.

Although there was not a change in the degree of stress as measured by clinical symptoms, this conclusion was based on data minus those individuals who were transferred out of the companies studied before the second testing. The subjects that were transferred out by testing two, had a greater number of clinical symptoms
on testing one with a mean average of 18.96. Based on Lazarus' model of stress, the function of coping is "to master, reduce or tolerate the internal and/or external demands that are created by the stressful transaction" (Folkman & Lazarus, 1980). The individuals who were transferred out of their original companies were unable to meet the external demands of basic training and were experiencing a greater degree of emotional/physical effects, clinical symptoms, suggesting that their coping skills were less effective. Clinical support for this assumption is described by Billings and Moos (1984) in their study where a relationship existed between the type of coping skills and emotional dysfunction. This present study suggests those subjects who were included in the statistical analysis were able to meet the demands of basic training and maintain rather than enhance the number of clinical symptoms at testing two. The possibility arises that the transferred subjects who were unable to meet the demands of basic training might have shown an increase in clinical symptoms at testing two in comparison to the non-transferred subjects who maintained the same level of clinical symptoms. Therefore, if the transferred subjects had been maintained in the study for testing two, an increase in the total number of clinical symptoms for the entire subject pool may have occurred.
Another possibility for no change in clinical symptoms on testing two may be that a change in the type of symptoms occurred rather than the number of symptoms. The CMI is comprised of both physical and psychological questions and this study only examined the total number of positive responses on the index. The test administration at testing two was difficult due to a large number of subjects coughing throughout the testing, whereas during testing one there was relatively no coughing done by the recruits. When the CMI was scored, it was also noted that a large degree of the positive responses on testing one occurred on questions related to psychological well-being rather than physical symptoms, whereas positive responses on testing two occurred on questions related to physical well-being.

A third possibility accounting for no change in clinical symptoms on testing two may be related to the subjects' "reappraisal" of basic training from a threat to a challenge (Lazarus & Folkman, 1982). This reappraisal of basic training may have prevented further exacerbation of clinical symptoms.

A fourth possibility for no change in clinical symptoms can be accounted for by the dynamic relationship between the person and situation as described in Lazarus' cognitive model. Initially, training is ambiguous and novel requiring more inference and consequently, personal
factors, such as beliefs and one's personal experience, have more influence in determining the meaning of the environment. The clinical symptoms present at testing one are more a result of personal factors whereas as the ambiguity decreases by testing two. The clinical symptoms are related more to situational factors (Lazarus & Folkman, 1982; Rotter, 1966, 1975). While there may be a change in the determinants of clinical symptoms, the level of stress may have remained consistent.

A final possibility for no change in clinical symptoms is the increase in the degree of coping skills used at testing two. The increase in the degree of coping skills as found in hypothesis two, suggests that the subjects as a whole increased their use of coping skills to more effectively manage basic training which resulted in no overall increase in clinical symptoms.

The second research objective examined the consistency of one's coping style over a period of time when used in stressful situations. The null hypothesis for objective two of no difference in the scores of WCCL Revised on testing one and two was rejected. This finding supports the conception of coping as a state rather than a trait. Lazarus' theoretical tenet that coping skills should be conceptualized as a state process rather than a trait gained empirical support in the Folkman and Lazarus study (1980) in which problem-focused
forms of coping increased in situations that were appraised as changeable, thereby holding the potential for control, and emotion-focused forms of coping increased in situations appraised as not amenable to change. A study done by McKay (1984) reinforced the idea of coping skills as a state, with coping skills being a function of how one appraises a situation. This present study further supports the dynamic process of coping skills in that they change as the situation unfolds. In some, a "trait" is seen as a stable property of a person that remains relatively the same over a variety of situations; whereas, coping skills are best viewed as a state which changes in relationship to the type of situation, its appraisal, and as the encounter unfolds.

The third and final research objective of this study was to investigate the feasibility of predicting the number of clinical symptoms an individual will exhibit from knowledge of the coping skills used in stressful situations. The null hypothesis for objective three of no relationship between the scores on the WCCL Revised factors testing one and the total number of clinical symptoms as measured by the CMI testing two was rejected. This result supports the dynamic relationship between the variables Lazarus et al. (1985) identified in their stress rubric used to explain how an individual reacts in a perceived stressful situation. This model defines
stress as an operation of many variables and processes in situations which tax or exceed a person's resources. No single variable, whether in the environment or within the person, defines stress. This system includes causal antecedents, both internal and environmental variables, which interact with mediating processes of appraisal and coping leading to the immediate and long term effects involving affect, and physiological and behavioral changes. The antecedents, processes, and effects all interact with each other.

This study examined only how mediating processes correlate to immediate effects. If Lazarus' stress rubric used to explain stress is correct, this study would find a correlation between coping skills and clinical symptoms since both are variables of mediating processes and immediate effects respectively. The third and final research objective of this study lends support to Lazarus' stress rubric by rejecting the null hypothesis of no relationship between the scores on the WCCL Revised factors testing one and the total number of clinical symptoms as measured by the CMI testing two.

There was a positive correlation between coping factors and clinical symptoms accounting for 17% of the variance. This correlation, given it is a correlation, does not imply a cause and effect relationship. Furthermore, Lazarus' tenet that the variables in the
stress rubric dynamically interact suggests that the relationship found should not be interpreted as coping style causing clinical symptoms or visa-versa but where both interact with each other as well as the other variables involved in the rubric. What is unfortunate from a practical perspective is that the variance accounted for by this relationship is relatively low. If the variance accounted for by the WCCL Revised had been greater, the inventory would have had predictive value in measuring clinical symptoms on the CMI. Since the CMI has been found to be predictive for those navy recruits who make frequent dispensary visits and fail to complete training (Rahe et al., 1972), the WCCL Revised could have been used as a screening device to assess those who are likely to fail basic training and/or be costly to the navy by making frequent sick call visits to the dispensary.

Although the variance between the coping factors and clinical symptoms is relatively low, it can be expected using Lazarus' cognitive model of stress. Other factors that may account for the total of variance between coping factors and clinical symptoms are personal variables involving commitments, values, beliefs, sense of control and environmental variables involving demands and restraints. Another important variable involves a second aspect of the mediating process which is appraisal.
involve what is at stake and what are one's available options for handling the situation. Finally, immediate and long term effects of how one is coping with the situation and psychological well-being can also play a part in the variance between coping style and clinical symptoms.

The results of the present investigation lend support to Lazarus' model of stress. Support was given to the tenet of coping viewed as a "state" rather than a "trait." Second, support was given to the dynamic interrelationship between the variables in Lazarus et al. (1985) rubric of stress. Finally, reasons were given for the lack of change in the level of stress over recruit training as acknowledgement that it was a stressful situation.
CHAPTER V

SUMMARY AND RECOMMENDATIONS

Summary

The purpose of this study was to investigate the relationship between coping skills and clinical symptoms in the context of a stressful situation. Stress has been recognized as a major health problem for decades. Man has faced and dealt with stressful situations throughout history. Contemporary theories regarding the etiology of stress have developed over the past one hundred years. In spite of the attention it has received, stress remains a phenomenon which is inadequately understood.

The scientific study of stress has been divided into three fields of scientific inquiry. Each field of scientific inquiry has had a different conceptual apex from which to study stress. The three conceptual foci are personality style, response or stimuli, and a mediating process. This study was developed using Lazarus' cognitive model of stress which is based on the dynamic relationship between intertwining variables involved in his conceptualization of stress.

This study has attempted to investigate the question of whether a relationship exists between coping skills
and clinical symptoms in a population of naval recruits involved in basic recruit training at Great Lakes Naval Recruit Training Command, Great Lakes, Illinois.

To investigate this relationship, a sample was drawn from six companies of naval recruits entering Great Lakes Naval Recruit Training Command on March 11 and 12, 1986. The 462 candidates selected for this study were considered representative of the total population of recruits. The final sample included in this study consisted of 336 male subjects ranging in age from 17-34.

Subjects were excluded from this study if they did not agree to participate or failed to complete the questionnaires, if they were transferred to other companies for failure to pass physical or academic requirements, or if they were medically or militarily discharged.

The WCCL Revised and CMI were selected as criterion instruments to measure coping style and clinical symptoms respectively. The WCCL Revised was specifically selected as the instrument to measure coping skills since it was developed by Lazarus (1966) and his colleagues to specifically measure coping factors that are used in stressful situations. The CMI was specifically selected as the instrument to measure clinical symptoms because it was suitable for collecting a large amount of pertinent medical and psychiatric data from a large number of
people. On the second day of training and 18 days later in the eight week basic training program, all subjects received the WCCL Revised and CMI questionnaires.

Three statistical null hypotheses were developed to test the research questions.

The first null hypothesis stated that "There will be no significant difference in the total number of clinical symptoms reported by naval recruits as measured by the Cornell Medical Index Health Questionnaire between the initial testing and the second testing."

No significant difference between clinical symptoms on testing one and testing two as measured by the CMI was found. Therefore, the null hypothesis was tenable. Examination of the mean score on testing one and two in comparison to a group of subjects not experiencing a stressful situation was considerably higher suggesting naval basic training can be considered a stressful situation. Various reasons for no difference in clinical symptoms on testing one and two were discussed. Missing data due to maturation, change in symptoms, reappraisal of basic training, decreased situational ambiguity and increase in the degree of coping skills used at testing two were examined as reasons for no difference in clinical symptoms.

The second null hypothesis stated that "There will be no significant difference in the scores for the
factors on the Ways of Coping Checklist Revised between testing one and the second testing."

Statistical analysis of hypothesis two indicated a significant difference at \( P < 0.05 \) for four of the five coping factors which suggested rejection of the null hypothesis. This outcome was discussed in terms of its support for conceptualizing coping style as a "state" rather than a "trait."

The third and final null hypothesis developed, stated that "There will be no relationship between the scores on the WCCL Revised factors testing one and the total number of clinical symptoms as measured by the CMI testing two."

A significant difference at \( P < 0.05 \) was found in the correlation between coping style and clinical symptoms as measured by the WCCL Revised and CMI respectively. This outcome was discussed in terms of its support for the theoretical relationship between mediating processes and short-term effects in the context of a stressful situation. In summary, the three null hypotheses lent support to the theoretical tenets conceptualized by Lazarus and his colleagues.

Recommendations

Findings frequently suggest new research questions as well as suggesting possible answers to questions
already posed. Therefore, the following recommendations for future research were concluded from this study.

This study should be replicated with a different sample which includes females as well as non-military personnel to increase the external validity of the findings. Furthermore, increased randomization in selection of the recruits may decrease the amount of error.

The study should be replicated following not only the subjects who stay in their original company but also those who are transferred to examine their clinical symptoms secondary to their performance. While this study found an initial degree of stress, the subjects finishing basic training could again be examined in future research to see if the stress level decreased. Finally, given the low level of variance accounted for by coping style as it relates to clinical symptoms, future research should explore how other variables interact/relate to short term clinical symptoms. The variables most likely to influence short term clinical symptoms as purported by Lazarus et al. (1985) in their stress rubric would include appraisal, environmental and personal variables.
REFERENCES


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APPENDICES
Appendix A

Cornell Medical Index Health Questionnaire
PLEASE NOTE:

Copyrighted materials in this document have not been filmed at the request of the author. They are available for consultation, however, in the author's university library.

These consist of pages:

- Appendix A, pages 96-99
- Appendix B, pages 101-104
- Appendix C, page 106
Appendix B

Ways of Coping Checklist Revised
Appendix C

Revised Ways of Coping Checklist Factors
Appendix D

Voluntary Consent Form
NAVAL RECRUIT TRAINING PROJECT

CONSENT FOR VOLUNTARY PARTICIPATION IN
A CLINICAL INVESTIGATION STUDY

Date: _______________

1. I,  ___________________________________________________________
   (Name) :  (SSN)
   have been asked to voluntarily participate in a research study.

2. This project is entitled, "An Analysis of the Correlation
   Between Coping Factors and Clinical Symptoms."

3. The purpose of this research study has been explained to me.
   I understand that this study is being conducted to examine the
   relationship between how a person copes with a stressful situation
   and the short term effects and physical changes that occur in
   response to the stressful situation. The following questionnaires
   I will be completing are part of a study examining how one
   copes with naval recruit training.

4. I will be maintained in this study for a period of two to
   three weeks.

5. The procedure for this study has been examined to me as
   follows: I will be given two questionnaires on the first day of
   basic training and on the first Monday of the third week of
   training. I must fill out these questionnaires accurately and
   completely in the order in which they are given to me. I am
   not to identify myself by writing my name on the questionnaires
   but will write my social security number in the top right hand
   corner of each sheet of paper.

6. Specifically, I am aware that the experimental part of this
   project is predicting results on the questionnaires, the question­
   naires have been used several times before.

7. The investigator has informed me that a total of 480 subjects
   will be enrolled in this project.

8. There are no risks to me from these questionnaires.

9. This research may not be of direct benefit to me; however, the
   results may aid in the training of naval recruits.

10. If I have any questions concerning this research study, I
    may contact Dr. Wilson at 312-688-4613, Psychiatry Department,
    Naval Hospital Great Lakes, Great Lakes, Illinois.

11. I understand that participation is voluntary and, if I do
    refuse to enroll, no loss of benefits or care to which I am
    entitled will occur.
12. The investigator may terminate my participation in this study if I do not complete the questionnaires.

13. If I should decide to withdraw from the research study, I will notify Dr. Wilson to ensure an orderly termination process.

14. Any new significant findings developed during the course of the research which may effect my willingness to participate further will be explained to me.

15. In all publications and presentations resulting from this research, my anonymity is guaranteed.

Date Signed __________________________ Patient Signature __________________________

Typed Name - Status __________________________

Witness Signature __________________________ Investigator Signature __________________________

Typed Name, Grade, SSN __________________________ Typed Name, Grade, SSN __________________________

I received a copy of the consent form on __________________________.

Patient's Signature __________________________
Appendix E

Privacy Act Statement
SUGGESTED FORMAT FOR PRIVACY ACT STATEMENT

1. **Authority.** 5 USC 301

2. **Purpose.** Medical research information will be corrected to enhance basic medical knowledge, or to develop tests, procedures, and equipment to improve the diagnosis, treatment, or prevention of illness, injury, or performance impairment.

3. **Use.** Medical research information will be used for statistical analysis and reports by the Departments of the Navy and Defense and other U.S. Government agencies, provided this use is compatible with the purpose for which the information was collected. Use of the information may be granted to non-Government agencies or individuals by the Chief, Bureau of Medicine and Surgery in accordance with the provisions of the Freedom of Information Act.

4. **Disclosure.** I understand that all information contained in this Consent Statement or derived from the experiment described herein will be retained permanently at Naval Hospital Great Lakes and salient portions thereof will be entered into my health record. I voluntarily agree to its disclosure to agencies or individuals identified in the preceding paragraph and I have been informed that failure to agree to such disclosure may negate the purposes for which the experiment was conducted.

(Signature) (Signature of Witness)

(Typed name, grade or rate)

(Date of birth)

"An Analysis of the Correlation Between Coping Factors and Clinical Symptoms"
BIBLIOGRAPHY


